

**The impact of same-language subtitling
on student comprehension
in an English as an Additional Language (EAL)
context**

Fanny Lacroix

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Abstract

The purpose of the present study was to investigate the impact of Same-Language Subtitles (SLS) on the subject-specific comprehension and the academic literacy levels of EAL students on the Vaal Triangle Campus of North-West University (NWU). Essentially, the study aimed to determine whether exposing students studying through English as an Additional Language (EAL) to subtitled lectures (live or recorded lectures) would help improve their comprehension of the academic content as well as their receptive academic literacy skills, compared to students who were not exposed to subtitled lectures.

This study stems from the identification of an academic performance-related issue on the Vaal Triangle Campus of NWU. Indeed, campus statistics show that the throughput rate of EAL students remains low, and that these students' academic literacy levels are inadequate. In other words, EAL students on this campus are underachieving and seem to have difficulties in mastering academic English.

Based on various studies that showed SLS to be a valuable tool in terms of learning and academic literacy, this study proposed to introduce SLS (both live via respeaking and offline) in the university classroom as a learning aid, thus optimising the time students spend in lectures.

Very little information was available in South Africa on the impact of SLS on the subject-specific comprehension of EAL students in a tertiary academic context. Furthermore, it had been anticipated that a certain number of technical constraints were likely to be encountered during the empirical investigation. These two factors made it difficult to predict what other factors could influence the outcome of the study. As a result, the study was based on the principle of Action Research, a research method characterised by the fact that the research is carried out in as many cycles as may be necessary in order to achieve the optimal conditions for a specific intervention.

Three cycles were necessary to reach the optimal design of the present study so that a confident conclusion could be made regarding the impact of SLS on comprehension and academic literacy. For each cycle, the intervention was carried out over an academic semester.

In the first cycle, a test group composed of EAL first-year Economics students was exposed to live SLS via respeaking during class, while a control group (also composed of EAL first-year Economics students) attended the same class at a different time, without SLS.

In the second cycle, the live SLS via respeaking were replaced with offline SLS. The intervention was taken out of the regular classes and was carried out in the context of practical revision classes scheduled specifically for the purpose of the intervention. The test group viewed subtitled videos of lectures, while the control group viewed videos without subtitles. After each viewing, all participants were required to complete a short comprehension test. This cycle was also conducted in first-year Economics.

The basic design of the third cycle was similar to that of the second cycle, but for the fact that the intervention took place in the context of a Psychology module, which, unlike the Economics module, was taught without the lecturer making use of slides.

After these three research cycles were completed, it could be concluded that offline SLS indeed have a positive impact on the subject-specific comprehension and the receptive academic literacy skills of EAL students in a tertiary academic context. This conclusion was supported by the following findings:

1. The first research cycle pointed towards a slight, but statistically insignificant benefit in terms of both comprehension and academic literacy. However, at this stage of the empirical investigation, the technical constraints made it difficult to draw a precise conclusion in that respect.

2. In the second research cycle, the SLS seem to have had a significant impact on the receptive academic literacy skills of the test group, compared to the control group. However, no such impact could be noted in terms of subject-specific comprehension. This was attributed to the presence of a confounding variable, namely slides used during the lectures. This once more made it impossible to draw a confident conclusion regarding the impact of SLS on comprehension.
3. The third research cycle made a more confident conclusion regarding the impact of SLS on subject-specific comprehension possible. Indeed, the results of the statistical analyses show that the test group performed significantly better in their semester test (covering the work done in all the recorded lectures) than the control group, which was not exposed to any videos at all.

On the basis of these findings, it was concluded that SLS in their offline form have a positive impact on the subject-specific comprehension and the receptive academic literacy skills of EAL students in a tertiary academic context, specifically if the students are given sufficient time to get used to the mode. This study seems to indicate that the benefits of SLS for comprehension can be recorded provided that students are exposed to the intervention over a longer period of time. However, there may be further scope for refinement as far as this study is concerned. It is therefore important that the topic be investigated further.

Keywords: academic literacy, academic success, comprehension, English as an Additional Language (EAL), higher education, listening ability, live subtitling, mother tongue, offline subtitling, reading ability, respeaking, Same-Language Subtitles (SLS).

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Chapter 1 General introduction

1.1 Introduction

This chapter deals with the issue of English as the language of learning and teaching at tertiary level in South Africa, and highlights its negative effect on the academic performance of students studying through English as an additional language (EAL). It also provides an overview of the applications of Same-Language Subtitles (SLS) in an educational context and further discusses the possibility of introducing both live SLS via respeaking and offline SLS in the classroom to act as learning support for EAL students, which is the central research problem this study proposes to investigate. This chapter goes on to introduce the research hypothesis and the method of investigation.

1.2 Contextualisation

1.2.1 English as the language of learning and teaching in South Africa

The South African Language in Education Policy promotes multilingualism and learning and teaching in the mother tongue (Language in Education Policy, 1997:1). However, English remains the main language of learning and teaching in the country at all levels of education (cf. Foley, 2004:57; Uys, Van der Walt, Van den Berg & Botha, 2007:69; Language Policy Framework for South African Higher Education, 1997:4).

The majority of South African learners go through most of their primary and secondary schooling in English. Young (1995:66) states that there is a marked preference for English as a language of learning and teaching on the part of EAL learners in South African schools. Barry (2002:112) explains this phenomenon by the fact that many EAL learners, especially black learners, seem to associate English with increased professional, social and educational

opportunities. As a result, many EAL students study English for up to 12 years, and use English as a language of learning for 8 of these years (Young, 1995:66).

At tertiary level, English is also the main language of learning in teaching (Foley, 2004:57; Uys *et al.*, 2007:69; Language Policy Framework for South African Higher Education, 1997:4), except at a small number of institutions where Afrikaans is used contiguously with English, like the University of Stellenbosch (Council on Higher Education, 2001:4). Out of the 21 universities in the country, 16 use English exclusively. The remaining 5 universities use both English and Afrikaans. Despite the fact that the Language Policy Framework for South African Higher Education (2001:4) points out that 5 universities seem to make informal use of South African indigenous languages¹ in the context of tutorials, no South African university actively promotes indigenous South African languages as languages of learning and teaching, apart from the University of Limpopo, which has recently started to offer a dual-medium BA degree in English and Sepedi² (Ramani & Joseph, 2006:4). There is therefore a discrepancy between the requirements of the Language Policy Framework for South African Higher Education and the role of indigenous South African languages in universities.

As a matter of fact, at this stage, students do not have the option to be educated in a language other than English (or Afrikaans, to a lesser extent), even if English is an additional language for them. Indeed, as the Language Policy Framework for South African Higher Education (2001:4) emphasises, very few tertiary education institutions in South Africa make use of a language of teaching and learning other than English.

¹ The term “indigenous” will be used in this study to refer to the Black South African languages, even though Afrikaans could in many respects be considered as an indigenous language, as it developed in South Africa, and even though it has strong European roots. The indigenous South African languages are Bantu languages and are classified in four different groups: IsiZulu, IsiXhosa, SiSwati and Isindebele belong to the Nguni group and Setswana, Sepedi and Sesotho belong to the Sotho group. Tshivenda and Xitsonga form the other two categories.

² Also referred to as Northern Sotho or Sesotho sa Leboa.

1.2.2 EAL and learning in South Africa

In South Africa, only 8.2% of the population speak English as a mother tongue (Beukes, 2004:4). As a result, apart from Afrikaans and English mother tongue students who have the option to pursue tertiary studies in their mother tongue, most other students study through medium English as an Additional Language (EAL).

Despite having gone through most of their schooling in English as a language of learning and teaching, as discussed in the previous section, the level of English academic literacy - which Weideman (2003:xi) defines as the ability to access, process and produce information in a specific language of learning and teaching - of many EAL learners is not optimal upon their arrival at university. This state of affairs is confirmed by the Language Policy for Higher Education (Ministry of Education, 2002: 4-5): "Language has been and continues to be a barrier to access and success in higher education; both in the sense that African and other languages have not been developed as academic/scientific languages and in so far as the majority of students entering higher education are not fully proficient in English and Afrikaans".

Adequate levels of English academic literacy are furthermore essential for EAL students to successfully complete their studies, as a strong link has been proven to exist between academic literacy and academic performance (cf. Barry, 2002:105; Butler & Van Dyk, 2004:1; Van Dyk & Weideman, 2004:1; Weideman & Van Rensburg, 2002:155). However, there is currently a growing concern regarding the increasing number of students entering university with inadequate levels of academic literacy in English. EAL students who display inadequate levels of English academic literacy are at a disadvantage since, besides having to understand the content of the lecture from an academic point of view, they also have to overcome the purely verbal component and deal with a code which they do not fully master (Neves, 2004:129).

Cummins (1991:169-170) differentiates between two levels of language proficiency, known as Basic Interpersonal Communicative Skills (BICS) and

Cognitive Academic Language Proficiency (CALP). He argues that learners will not be able to cope with academic tasks if they have only acquired BICS. According to the Test of Academic Literacy Levels (TALL)³ results, it seems that the majority of EAL students on the Vaal Triangle Campus have not yet fully acquired CALP. This illustrates a statement made by Hirst, Henderson, Allan, Bode and Kocatepe (2004:66), albeit in an international context, in which they highlight the influence of the students' background on their ability to cope with the demands of tertiary education: "With the 'massification' of higher education and the associated increased diversity of the student population, there is no guarantee that students have been equipped by their previous life experiences to cope with the academic or tertiary literacies required of them". This is also true for the majority of South African students who use EAL.

According to Butler and Van Dyk (2004:1), the inability to cope with academic English causes the students to struggle with the reading material. But reading is not the only skill which is affected by a lack of academic literacy. Oxford (1993:206) and Strauss (2004:92) add that EAL students may also find it difficult to understand the oral message delivered during lectures. Since students spend a considerable amount of time in lectures, EAL students may lose this opportunity for learning through listening, due to the language barrier. According to Boughey (1994), students for whom the language of learning and teaching is a second, sometimes third or even fourth language need extra support to help them understand the course contents given during a lecture and thus to acquire the subject-specific terminology in the language of instruction. Boughey reckons that students who do not speak the language of learning and teaching as a mother tongue "often experience difficulty in constructing meanings in situations where the referents for meanings are purely linguistic" (1994:23).

³ North-West University's developmental strategy consists of requiring "at-risk" students to attend extra academic literacy classes. In order to determine whether they are academically literate or not, all students are required to write an academic literacy placement test (the Test of Academic Literacy Levels or TALL for students who study through medium English) at the start of their first year of study at North-West University. The task types that form the TALL are based on AL tasks that the students

For example, many EAL students experience difficulties to extract the meaning of an academic text or to produce meaning when writing an academic text.

It therefore stands to reason that, should a support system be put in place in order to bridge the language gap and thus help EAL students access the lecture content better, by enhancing receptive academic literacy abilities (reading and listening abilities), learning would be optimised, which could in turn have a positive effect on the students' performance. Such an intervention may be what Webb (2002:6) was referring to when pointing out that language, due to its essential role in educational development, "requires serious and informed attention".

1.2.3 EAL and learning on the Vaal Triangle Campus of North-West-University

1.2.3.1 Academic literacy

Low levels of English academic literacy among first-year students have been noted on the Vaal Triangle Campus of North-West University (NWU). This provides the context for this study, operating on the principle that optimising the time students, and particularly EAL students, spend attending lectures, would benefit them by improving their receptive AL abilities (reading and listening comprehension), thus helping them understand the academic content better. This led to the conceptualisation of the present study, which sought to identify an effective method to help EAL students improve their receptive AL abilities and, as a result, their comprehension of the academic content.

According to the 2009 (the year the study started) Status Report compiled by the Institutional Language Directorate of North-West University for its Vaal Triangle Campus (Verhoef, 2009:2), almost 90% of students on this campus did not speak English as a mother tongue in 2007. Their home languages are

will be expected to carry out in a tertiary academic context.

other official languages of South Africa, such as the Nguni languages (14.5%), the Sotho languages (28.9%) and Afrikaans (32.8%), but also other African languages (0.37%), as well as European languages (French, German, Greek, Italian, etc.: 7.4%) and Eastern or Asian languages (0.4%). There is therefore a majority of EAL students on the Vaal Triangle Campus.

But more importantly, the results of the Test of Academic Literacy Levels (TALL) show that the majority of students have not reached the level of English academic literacy necessary for them to complete their studies successfully. This was highlighted in a report on the *Toets vir Akademiese Geletterheidsvlakke* (TAG) and the TALL results for both the Potchefstroom and the Vaal Triangle campuses since 2003. The results specific to the Vaal Triangle campus for the TALL show that less than half of the students have passed the test every year, since 2003 (Verhoef, 2010:1). The fact that only a minority of students pass this assessment of English academic literacy levels indicates that the majority of them are likely to experience difficulties coping with the content of lectures as well as reading material in English. It must however be noted that the TAG and TALL are not standardised from one year to the next, which means that the tests could be more difficult from year to year, thus making it difficult to confidently state that the academic literacy levels of students on the Vaal Triangle Campus are too low.

Difficulties in understanding lectures may lead to poor academic performance. According to Weideman (2004:1), “low academic language proficiency levels have indeed been mooted as one of the primary causes of the lack of academic success experienced by many students at South African universities”. In order to address this problem, the students who fail the TALL are required to register for an academic literacy course presented on campus, which consists of two semester modules: AGLE 111 and AGLE 121. However, all students, even those who passed the test, are expected to register for the second semester module (AGLE 121).

1.2.3.2 Receptive academic literacy abilities

According to Butler and Van Dyk (2004:1), the inability to cope with academic English causes students to struggle with the reading material at tertiary level. This problem is further compounded by the fact that South African learners tend to display poor reading skills at all levels of education (Pretorius, 2002:92). At tertiary level more specifically, a significant number of first-year students display inadequate reading comprehension levels (Perkins, 1991; Dreyer, 1998) and are therefore unable to fulfil the requirements of the academic environment in terms of reading. Nel, Dryer and Klopper (2004:95) succinctly describe these requirements as having to cope with “a large quantity of reading in a limited amount of time”. They add that students “need to use what they read for purposes such as absorbing, analysing and summarizing information to use in writing or in seminars” (2004:95).

At NWU, all students who are registered for AGLE 111/121 have to complete a reading ability test. This test aims at evaluating reading speed and comprehension. The students are expected to attain the following requirements, set by the reading laboratory: students need to be able to read 420 words per minute (wpm) and to understand 80% of the content of the written material⁴. However, the results of the reading test show that few students actually have the required reading speed and level of reading comprehension when they arrive at university. In order to address this problem, students are expected to complete a reading support programme at the end of which they write a final test. The final results recorded on the individual students' score cards seem to show that attending the reading laboratory sessions contributes to improving the reading comprehension and the reading speed of students. When discussing receptive abilities, one should also take listening ability into account. Indeed, as students generally spend a considerable amount of time integrating information through listening to lecturers, it can be argued that listening ability ought to be honed to the

⁴Requirements based on figures provided in Research, Rationale and Results, a report on the research basis and effectiveness of Reading Plus® (Taylor Associates/ Reading Plus®, 2009:30).

same extent as reading ability, so that the time spent in lectures is optimised. This is particularly relevant to EAL students who, according to Young (1994:159), experience difficulty in processing academic discourse. However, listening is a skill which often seems to be expected to develop by itself, and unlike for reading, no system has been put in place to evaluate or promote it on the Vaal Triangle Campus of NWU.

Although developmental strategies have already been implemented at NWU to support students who have not reached the required levels of academic literacy and reading ability upon their entry at university, this study contends that the introduction of subtitles (in the form of live or offline SLS) in the classroom may help to further improve receptive academic literacy abilities through the double exposure inherent to SLS and, as a consequence, students' ability to access and process the subject specific content presented in lectures.

1.3 Theoretical framework

Audiovisual (AV) materials have become a crucial and ubiquitous part of modern life, be it in the professional, academic or entertainment domains (Díaz Cintas & Remael, 2007:8). In the academic (or educational) domain specifically, AV material has proved to be an asset in terms of learning and has found its way into the classroom, often "to add 'colour' and variety to lessons on different subjects" (Neves, 2004:129). However, a number of studies have shown that AV material fully realises its educational potential when used together with SLS (Garza, 1991; Neuman & Koskinen, 1992; Koolstra & Beentjes, 1999; Bird & Williams, 2002; Takeda, Joshi & Pandey, 2002), especially in terms of literacy and comprehension. This aspect of AV material will be discussed in detail in the context of the literature review. But before this can be done, a working definition and an overview of Same-Language Subtitling (SLS) through respeaking and post production SLS will be provided.

1.3.1 Subtitling: a working definition

This study investigates the use of SLS in the classroom as a learning aid to help improve the receptive academic literacy ability and subject-specific comprehension of students for whom the language of learning and teaching is an additional language. A suitable working definition of SLS in this context therefore needs to make provision for this very specific application of SLS. In their book on subtitling, Díaz Cintas and Remael (2007:8) define subtitling as:

a translation practice that consists of presenting a written text, generally on the lower part of the screen, that endeavours to recount the original dialogue of the speakers, as well as the discursive elements that appear in the image (letters, inserts, graffiti, inscriptions, placards and the like), and the information that is contained in the soundtrack (songs, voices off).

This definition seems to focus on the use of SLS together with AV material such as films or TV programmes, in which dialogue plays an important part and in which images are likely to provide a significant amount of information. Therefore, it could be said that it is too specific, in the sense that it does not encompass all possible uses of SLS.

Caimi (2006:86), in her article on audiovisual translation as an aid to language learning, states that:

[m]onolingual or intralingual subtitling is a form of screen translation which involves the transfer from oral language into written language. There are two kinds of intralingual subtitling: one is used as an accessibility aid for a target audience which is deaf or hard-of-hearing, the other is used as a didactic aid for those who are not familiar with the language spoken in the audiovisual text.

Caimi's definition thus widens the scope of AV material which may be used in conjunction with SLS. It also provides important additional information as to the different functions of SLS, by stating that this type of subtitling (which she refers to as "monolingual" or "intralingual" can be used both to facilitate

access to information for a deaf or hard-of-hearing audience and to bridge a potential language gap between the AV material and the targeted audience. The latter function is what this study concerns itself with, as it investigates the use of SLS (or monolingual or intralingual subtitles) as a didactic aid for hearing EAL students.

Furthermore, the study involves the use of both live and offline subtitles. Offline subtitles are also referred to as “pre-prepared subtitles” (Díaz Cintas & Remael, 2007:19). These two methods of production will be discussed in detail in the next section. It is therefore suggested that the following definition of subtitling be considered: “a form of monolingual or intralingual screen translation which transcribes oral language into written language and is used to facilitate access to the information presented in the AV material”.

1.3.2 Subtitling methods: offline and live

1.3.2.1 Offline subtitling

Díaz Cintas and Remael (2007:19) state that offline subtitles are done after the AV material requiring subtitles has been shot and some time before it is broadcast. They add that offline subtitles can be subdivided into two categories: Subtitling in complete sentences, which is commonly used with films and TV programmes, and reduced subtitling, which aims to capture the gist of programmes such as the news, interviews or documentaries.

Historically, offline subtitles first appeared shortly after the invention of film, though they were rather known as “intertitles” at the time, due to the fact that they were placed between sequences of the film (Ivarsson, 2004:1). However, from 1927, sound films appeared and the titles became redundant, since the audience could now hear the dialogues. Nevertheless, the presence of the spoken word meant that translation might be required. As a result, titles were inserted at the bottom of the images, thus becoming known as “subtitles” (Ivarsson, 2004:2).

The next section provides background information regarding the production of live subtitles, more specifically a recent method referred to as “respeaking”. This method will be involved in one of the experiments planned in the context of the current study.

1.3.2.2 Live subtitling and respeaking

According to Díaz Cintas and Remael (2007:19), live subtitling is a relatively new method of production and is only used when the subtitles cannot be produced in advance, as is often the case with news bulletins, sports programmes or political statements, for example. Díaz and Remael (2007:19) further divide live subtitling into “human-made subtitling” and “machine-translated subtitling” (Although one could justifiably use the expression “machine-made”, insofar as live subtitles are mostly intralingual). Human-made live subtitling is usually carried out using a velotype, stenotype, dual keyboard or Speech Recognition (SR) software. The latter method is referred to as “respeaking” (Romero-Fresco, 2011:21-22). Since this specific method will be used in the first research cycle, it is further defined below.

Since the end of the 1990s, respeaking is a skill which has been increasingly sought after in the AV industry (Lambourne, 2006:1)³. Respeaking consists in producing live intralingual subtitles using speech recognition software. A number of definitions and names have been attributed to respeaking since its first implementation by VRT (Vlaamse Radio- en Televisieomroep or Flemish Radio and Television, Belgium) and the British Broadcasting Corporation (BBC) in 2001 (Romero-Fresco, 2011:15). The definitions will be discussed first. Arumí and Romero-Fresco (2008:107) define respeaking as “speech recognition-based subtitling”, while Eugeni (in Arumí-Ribas & Romero-Fresco, 2008:107) provides a more elaborate definition. According to him, respeaking is “... a technique thanks to which the respeaker listens to the source text and

³For the purpose of this study, the term respeaking will refer to live intralingual or same-language subtitling (SLS), even though some work has been done internationally on live interlingual subtitling through respeaking.

re-speaks it. The vocal input is processed by speech recognition software which transcribes it, thus producing real-time subtitles”.

Romero-Fresco (2011:10) provides a similar definition to that of Arumí-Ribas and Romero-Fresco above. Respeaking is defined as: “the production of subtitles by means of speech recognition”. He indicates, however, that it is a very general definition and too broad to give a precise idea of what respeaking involves. Therefore, attempting to provide a definition that would be neither too simplistic nor too complex, Romero-Fresco (2011:10) states that respeaking is

[a] technique in which a respeaker listens to the original sound of a live programme or event and respeaks it, including punctuation marks and some specific features for the deaf and hard of hearing audience, to a speech recognition software, which turns the recognized utterances into subtitles displayed on the screen with the shortest possible delay (Romero-Fresco’s emphases).

However, Romero-Fresco (2011:10) acknowledges the fact that some of the terms used in this definition themselves require further explanation. These terms are underlined in the above definition and their definitions can be found in Addendum A of this thesis. Romero-Fresco’s definition of respeaking is complete and informative. However, it implies a use of respeaking which is not relevant to the current study in the sense that it implies that respeaking is used solely for the benefits of a deaf and/or hard of hearing audience. Indeed, respeaking was originally designed to allow deaf and/or hard of hearing audiences to access information presented orally, and has until now mainly been used for that purpose. However, it has been found that, in a professional context, subtitles produced via respeaking can also offer the benefit of a textual confirmation of the speaker’s discourse for an EAL audience, thus enhancing comprehension (Bain, Basson, Faisman & Kanevsky, 2005:591).

In an academic context, subtitles produced via respeaking can help facilitate access to lectures delivered in English for the students for whom English is an

additional language (Bain *et al.*, 2005:592). Since the benefits of SLS via respeaking for EAL students form part of what this study investigates, it is necessary to adopt a working definition of respeaking that would apply to the context of the study. Eugeni's definition above, as quoted by Arumí-Ribas and Romero-Fresco (2008:107) may be more relevant, due to the fact that it does not imply the mode is used to benefit deaf and hard-of-hearing audiences only.

The main reason why this study investigates the use of SLS as an aid for EAL students to access and process academic information in lectures is that various studies (cf. Spanos & Smith, 1990; Garza, 1991; Leitch & MacMillan, 2001; Bird & Williams, 2002; Kothari, Takeda, Joshi & Pandey, 2002; Neuman & Koskinen, 2002; Eugeni & Macke, 2006; and Ayonghe, 2009) have found both offline SLS and SLS via respeaking to facilitate access to, and therefore improve the comprehension of audio material, through double exposure (aural and written) to the content. These studies will be discussed in more detail in the next chapter.

1.4 Central problem statement

This study therefore investigates the extent to which the double exposure (aural and written) to lecture content provided by SLS will facilitate the improvement of students' receptive AL ability (listening and reading skills) and, as an anticipated consequence, the subject-specific comprehension of EAL students on the Vaal Triangle Campus of the North-West University.

1.5 Research aims

The primary aim of this study is to show that the introduction of SLS in the classroom will improve the receptive academic literacy abilities as well as subject-specific comprehension of EAL students. In order to achieve the primary aim, the following objectives will have to be reached:

- Identify the problems related to receptive academic literacy abilities of EAL students.

- Establish whether SLS improve EAL students' receptive academic literacy abilities.
- Establish whether SLS improve EAL students' subject-specific comprehension of the lecture content.
- Identify a strategy for the implementation of SLS in the EAL classroom.

1.6 Hypothesis

The hypothesis of this study is that SLS can be used as a way to facilitate access to lectures for EAL students who struggle with English as the language of learning and teaching, and that the double exposure (visual and aural) to the course content will improve receptive academic literacy and the comprehension of lecture content.

1.7 Method of investigation

In order to achieve the aims described above, the study consisted of a literature review and an empirical investigation.

1.7.1 Literature review

Sources dealing with the topics of South Africa's Language Policy, the academic literacy ability (with specific reference to the receptive abilities) of EAL students, both in South Africa and internationally and the impact of SLS on learning will be used as a basis for the literature review.

The purpose of the literature review is to contextualise the issues related to the receptive AL abilities of EAL students and to provide an overview of studies that have shown that SLS have educational benefits. It focuses on the following three issues:

- The role of South Africa's Language Policy in Education
- The impact of EAL on academic performance, focusing specifically on students' reading and listening abilities
- The benefits of SLS as an aid to learning

1.7.2 Empirical investigation

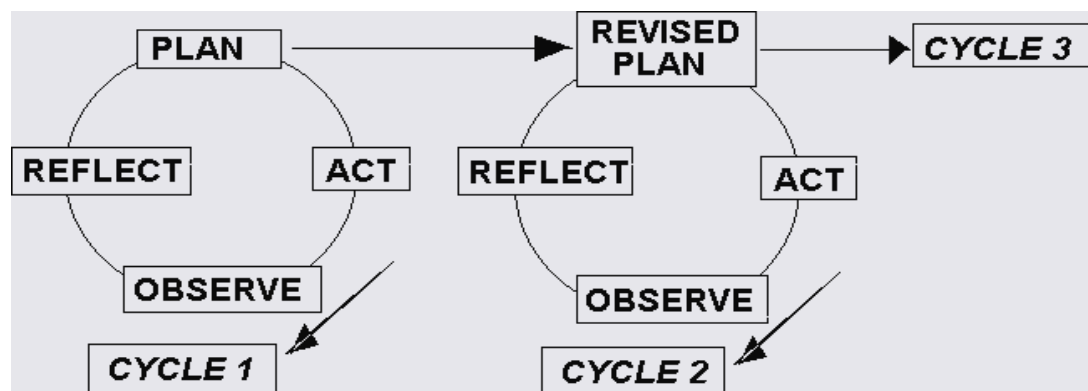
The aim of the empirical investigation is to determine whether SLS improves the comprehension of EAL students in the context of the academic lecture and whether this method is therefore a viable option in terms of the improvement of the academic literacy levels and academic performance of such students. This section provides information regarding the research design that was applied to the project, namely Action Research. It then outlines the research methodology, which consists of three interventions.

1.7.2.1 The principle of Action Research

Despite the fact that a number of studies have shown the introduction of SLS in the classroom to be educationally beneficial, the research methodology for determining the impact of SLS on comprehension in a tertiary academic context has not been established sufficiently in the South African context. This, added to the possible technical constraints that were likely to be encountered during the empirical investigation, made it difficult to predict with certitude what additional factors might have an influence on the outcome of the study. It was therefore deemed necessary to carry out the investigation in cycles, in order to reflect on and refine the method, until the optimal conditions for an intervention using subtitling has been found. This led to the selection of Action Research as a research design for this specific project.

Indeed, the study was thought to lend itself to the “*plan, act, observe and reflect*” cycle of action that is characteristic of Action Research as described by Zuber-Skerritt (1992:11). Moreover, Action Research focuses on a practical problem for which a practical solution is sought (Nieuwenhuis, 2010:74). In the context of this study, the practical problem is the low level of English academic literacy of EAL students on the Vaal Triangle Campus of NWU, which leads to poor academic performance. The purpose of this study is to investigate the possible contribution SLS could make towards a solution for this problem.

Figure 1: The traditional spiral of Action Research cycles, as shown in Riding, Fowell & Levy (1995:3)



According to Zuber-Skerritt (1992:11), the “plan” element of the cycle of Action Research corresponds to the problem analysis and the design of a strategic plan. Similarly, the current study stemmed from the identification of the problem discussed above, which called for the design of a plan aiming at providing a solution. The plan consisted in introducing SLS in the classroom, with the anticipation that this would help improve listening and reading comprehension of the learning material in lectures as a result of the double exposure to such material, and as a consequence, the subject-specific comprehension of students.

The second step of an Action Research cycle is “act”, which Zuber-Skerritt (1992:11) defines as the implementation of the plan in question. More detail as far as the implementation is concerned is provided in the rest of this chapter. The third step, “observe”, refers to the evaluation of the intervention using relevant methods and techniques. This step is used in order to evaluate the efficiency of the intervention in terms of the study’s main objective, which is to improve the receptive English academic literacy ability of EAL students as well as their subject-specific comprehension through the introduction of SLS in the classroom. Any problematic issue that arises from the observation phase is addressed in the context of the fourth step, “reflect”. The purpose of this step is to reflect both on the results of the intervention and on the research process itself. This is done in order to determine whether a new cycle of research is necessary, in case problems are identified during the

reflection process. This critical evaluation process will therefore be carried out in the context of this study, so as to suggest possible improvements in terms of the research process. Such improvements may be necessary should the intervention not occur smoothly, or should certain variables affect the anticipated outcome.

It is also interesting to mention that Action Research is more and more often referred to by scholars (Zuber-Skerritt, 1992; Kemmis, 1991) as an effective method to improve learning and teaching practice, especially in a higher education context (Zuber-Skerritt, 1992:10), as it is considered a way of bridging the gap between educational research and classroom teaching (Zuber-Skerritt, 1991:xii). In this context, the experimental design of this study will be refined over different cycles of research until it is considered to be optimal for testing the hypothesis described in section 1.5.

After following these steps, the investigation finally consisted of three cycles that are discussed in the following section.

1.7.2.2 The first research cycle

This cycle took place in the second semester of 2010. The SLS used in the first cycle were produced live via respeaking, which means that they were created on the spot, or live, using speech recognition software. After signing a consent form, the students who chose to get involved in this research cycle were divided into two groups: a test group and a control group. The students in the test group were exposed to SLS via respeaking in the context of their usual Economics classes (module code: ECON 121), while the students in the control group were not exposed to any subtitles in their classes. Before the intervention took place, all students were required to sit for a pre-test in English Academic Literacy. The test in question was a previous version of the TALL, in other words not the version used during 2010 to measure these students' levels of academic literacy in English.

The classroom setup for the experimental group was as follows: the lecturer was filmed while presenting the class and the resulting video was projected onto a screen behind the lecturer. As the respeaker reformulated the lecturer's speech, the SLS appeared on the screen, in the Dragon Pad window, for the students to read. This allowed students to take in the non-verbal cues as well as the information provided by the lecturer.

Here, it must be highlighted that the SLS were not a completely verbatim transcription of the lecturer's words, but rather a highly mediated transcription, focusing on the core concepts of the lecture. The reason for this is that, depending on the speech rate of the lecturer, verbatim respeaking may be very difficult to achieve for respeakers (Arumí-Ribas & Romero-Fresco, 2008:3), who also have to dictate punctuation, chunk the transcription into paragraphs and edit the subtitles if serious errors have been committed by the speech recognition software. Moreover, according to Arumí-Ribas and Romero-Fresco (2008:108), verbatim respeaking would be very difficult for the audience (i.e. the students) to follow.

Throughout the semester, the students in both groups completed the regular evaluations set by the lecturer, as normal. As a post-test at the end of the study, all students were required to write the same English Academic Literacy test (TALL) they wrote as a pre-test. The data pertaining to the class evaluations and the TALL was collected and analysed in order to determine whether an improvement had indeed taken place in the students of the experimental groups in terms of receptive academic literacy ability and subject-specific comprehension after they were exposed to SLS in their ECON 121 class.

1.7.2.3 The second research cycle

The second research cycle took place during the first semester of 2011, in the context of the module ECON 111 (first-semester Economics). Due to a number of constraints experienced in the first research cycle, the SLS via respeaking were replaced with offline SLS, that is to say the subtitles were

created after the video recording of the lectures. This means that the relevant participants would not be exposed to the SLS while in class. Instead, practical revision classes were scheduled, in which the participants were shown the video of the lecture. The test group watched the video with offline subtitles and the control group watched the video without any subtitles. This time, the SLS were created so as to convey the totality of the lecturer's utterances, within the constraints inherent to subtitling.

After each viewing, the participants were required to complete a comprehension test based on the content of the lecture and compiled by the official facilitator for ECON111. At the end of the intervention, students were also required to write the same TALL they had already completed at the beginning of the year, as a post-test. The TALL data for both the pre- and post-test was collected and analysed in order to determine whether there was any improvement in students' receptive academic literacy ability. Furthermore, the data from the comprehension tests based on the lecture content of ECON 111 was used in order to determine whether any significant improvement could be observed with regard to students' comprehension of the subject-specific content that was presented during lectures.

1.7.2.4 The third research cycle

In order to further refine the design of the study, and in accordance with the principle of Action Research, a third and final research cycle was carried out. This time, the intervention took place in the context of the psychology module PSYC 121, in the second semester of 2011.

Lectures were video recorded and subtitled using the offline method. The videos were then shown to volunteers from the PSYC121 class in an additional practical class, in other words as a form of revision. These participants constituted the test group. Since the aim of the research was not to determine whether there was a difference between subtitled and un-subtitled video recordings of lectures, but simply whether subtitled video recordings made a difference to comprehension, all students who did not

watch these videos were used as a control group. Unlike in the second cycle, this study focused on student performance in normal class and semester tests written by both test and control group. In this way, variables such as those that would have been introduced by post-video tests were eliminated, yielding a more uncluttered view of the contribution of the SLS videos to improved comprehension as evidenced in improved performance in these tests, and therefore in the module as a whole.

1.7.2.5 Ethics clearance

This research project is included under Ethics Clearance # NWU-00031-07-S1, obtained by Prof. Susan Coetzee-Van Rooy. Title: Perceptions of English Proficiency and Multilingualism. Focus area: UPSET.

Chapter 2 Literature Review

2.1 Introduction

As indicated in Chapter 1, this study investigates the use of offline or post-production same-language subtitles (SLS), as well as SLS produced live via respeaking, in the classroom regarding its potential impact on the receptive academic literacy abilities and subject-specific comprehension of EAL students.

A number of studies have highlighted the benefits of audiovisual material in the EAL classroom and more recently, research carried out by the Liberated Learning Consortium has focused on the use of SLS at university level in order to facilitate the access to course material for deaf and hard-of-hearing students.

In this chapter, the various studies related to the use of SLS as learning support for EAL students will be reviewed.

Before this can be done, however, it is essential to discuss the reasons why an intervention like this was deemed necessary in the first place. In order to do so, the first section will be dedicated to the current South African Language Policy in Education. The second section will then deal with the impact of English as an additional language (EAL) on academic performance, at which stage the reasons why there is indeed a need to support EAL students in terms of learning will be highlighted.

The review of research carried out so far on the use of SLS via respeaking in an educational context, as well as a review of the benefits of AV material and SLS in the classroom will be presented in the third section.

2.2 The South African Language Policy in Education

2.2.1 Historical background

Before dealing with the role of the South African Language Policy in Education, it is important to give a brief overview of South Africa's linguistic context.

Today, South Africa is home to many different languages (Beukes, 2004:3). This is due to the influx of immigrants from many different nationalities and cultures, which South Africa has experienced throughout history. Twenty-five languages are currently in use in the country (Beukes, 2004:3), with 11 of them enjoying the status of official languages, i.e. more official languages at a national level than any other country (Mvulane, 2003). These official languages are: English, Afrikaans, Sesotho, Sepedi, Setswana, IsiZulu, IsiXhosa, IsiNdebele, Tshivenda, SiSwati and Xitsonga.

However, there were not always 11 official languages in South Africa. During the Apartheid regime, which lasted from 1948 to 1994, the official languages were only English and Afrikaans (Beukes, 2004:5). But since the Apartheid regime came to an end on 27 April 1994, the South African Constitution makes provision for the preservation of language diversity in the country and recognises the nine Black South African languages (Sesotho, Sepedi, Setswana, IsiZulu, IsiXhosa, IsiNdebele, Tshivenda, SiSwati and Xitsonga) as official languages, alongside English and Afrikaans. Besides, the Constitution prescribes affirmative action for the indigenous South African languages that were marginalised in the past: these languages "must enjoy parity of esteem and must be treated equitably" (Beukes, 2004:5). Webb (2002:2) states that "[t]he constitutional language stipulations can be regarded as a statement of the "mission" which the SA government has set itself in order to give expression to its visions and values, and the tasks it wants to perform in the language management of the country".

The provisions made by the Constitution (1996:4) in terms of language, as per Article 6, are as follows:

- The state must take relevant measures in order to promote the status of the indigenous South African languages.
- While requirements differ according to the level of government, government must make use of indigenous languages for the purposes of government.
- The national government and provincial governments must regulate and monitor the use of official languages, so that all official languages can enjoy parity of esteem and can be treated equitably.
- The Pan South African Language Board must promote, develop and ensure respect for not only all 11 South African official languages, but also the Khoi, Nama and San languages, sign language and all non-official languages commonly used by communities in South Africa (such as European, Asian and Middle-Eastern languages, for instance).

With regard to the new South African Constitution, a number of measures have been put in place in order to achieve equal status for all South African languages:

- The Pan South African Language Board (PanSALB) was established, whose mission is to develop and promote South African languages and to monitor the implementation of the Constitution's provisions in terms of language (Webb, 2002:3).
- Article 30 in the Bill of Rights of the Constitution (1996) supports the language clause, by recognising language as a human right (Beukes, 2004:5). According to the Bill of Rights, "[e]veryone has the right to use the language and participate in the cultural life of their choice, but no one exercising these rights may do so in a manner inconsistent with any provision of the Bill of Rights".
- The Language Task Group (LANGTAG) was convened by the Minister of Arts, Culture, Science and Technology. Its mission is to "advise

government on developing a policy and implementation plan based on the constitutional language provisions" (Beukes, 2004:8).

In line with the liberal, rights-based paradigm of the South African Constitution, the Constitution furthermore

- prohibits discrimination against anyone on the grounds of language;
- prescribes that everyone has the right to education in any official language(s) of their choice;
- enshrines the right of linguistic communities to use their cultures and languages; and
- prescribes that every person has the right to access to interpreting during a trial, and arrested and accused persons to information in a language that they understand (Beukes, 2004:6).

However, the Language Policy has been subjected to criticism. Although Bamgbose (2003:7) recognises the fact that the South African Constitution is one of the most progressive on the African continent, he also states that the South African Language Policy is not "conforming to the ideal", even though it is "better designed and formulated than those of most African countries". This implies that at least some of the objectives of the Constitution as far as language management is concerned may not have realized. Webb (2002:3-4) identifies at least three reasons for criticism: the first is that it is impossible, from both a practical and a financial point of view, to implement a language policy involving 11 official languages. The second is that the principles of parity of esteem, equity and language promotion the Language Policy embraces may conflict with the "qualifying clauses", which make it possible for state institutions to avoid putting the Language Policy into practice. The third reason is that state institutions themselves use English as a working language, thus contradicting the spirit of the constitution. Du Plessis (2000:96) explains this lack of motivation on the part of government by the fact that South Africa may be a "non-active endoglossic nation", i.e. a nation that supports the use of its official language(s) as primary language(s) in theory, and fails to put the theory into practice.

Likewise, Alexander (2000:8) denounces the general “lack of political will among African leaders when it comes to improving the status of African languages in their countries and the modernisation of the corpora of these languages”. On the same topic, Alexander (2002:86) adds, in a subsequent publication on the transition from Apartheid to democracy in South Africa, that, in his opinion, the constitutional ideals of the country in terms of language, such as the promotion of multilingualism and of linguistic diversity, have not yet found their way onto the national planning agenda. Instead, English seems to be the language being promoted as the *lingua franca* in South Africa, to the detriment of indigenous languages. Indeed, Moodley (2000:103) points out the fact that, although there is talk of an African Renaissance, African languages are mainly used for daily interpersonal communication, in “the private realm”, whereas dominant Western languages such as English are considered as the key to wealth and opportunities.

2.2.2 The South African Language Policy in Education and Higher Education

The second paragraph of the South African Language Policy in Education, which states that everyone has the right to be educated in the official language(s) of their choice, will be focused on in this study, since it concerns itself specifically with the domain of education. This section therefore deals with the South African Language Policy in Education and Higher Education and shows that a discrepancy exists between these policies and the actual practice.

The official Language Policy in Education was announced by Minister Sibusiso Bengu on 14 July 1997. The South African Language in Education Policy should promote multilingualism and education in the language that learners know best, i.e. their mother tongue. As a matter of fact, Article 29(2) of the Constitution (1996:10) stipulates that “[e]veryone has the right to receive education in the official language or languages of their choice in public educational institutions where that education is reasonably practicable”. However, in a country like South Africa, which boasts 11 official languages,

this may seem like a very difficult task to accomplish, especially when one takes into consideration the fact that indigenous languages were never considered as languages of learning and teaching before 1994.

The linguistic oppression in existence during the Apartheid regime came to an official end with the revision of the Language Policy, which proclaimed the nine indigenous South African languages to be languages of learning and teaching (Conner, 2004:4). Indeed, Article 29(2) of the Constitution (1996) and the LANGTAG report (1996:43) state that everyone has the right to be educated in the language or languages of their choice when this is “reasonably practicable”.

However, it has been argued that the Language in Education Policy has not lived up to the expectations formulated in the Constitution in terms of language equity. For instance, Barry (2002:105) is of the opinion that the Language in Education Policy is “a symbolic gesture”, insofar as it has actually failed to promote indigenous South African languages as languages of learning and teaching in schools. In her article on language equity and assessment in South African education, Barry (2002:108) points out the fact that, although government wishes for all 11 official languages to enjoy the same status in education, English remains the main language of learning and teaching in schools and universities and that “the acquisition of English is still regarded as being more important than either the maintenance or development of the indigenous languages” (Barry, 2002:109).

As a result, and contrary to what the Constitution and the LANGTAG report wish for, the Black South African languages are used very little as languages of learning and teaching. Foley (2004:57) confirms this by stating that, at higher education level, English (and Afrikaans, although to a lesser extent) is the only fully functional language of learning and teaching. Although the Language Policy Framework for South African Higher Education (2001:4) refers to 5 of the 16 South African universities as making use of South African indigenous languages in the context of tutorials, it also specifies that this use is only informal and that at the end of April 2000, not a single university

seemed committed to promoting indigenous languages as languages of learning and teaching.

However, the University of Limpopo has, in recent times, started to offer its students the option to follow classes in Sepedi, in the context of a dual-medium BA degree in English and Sepedi, called the BA in Contemporary English Language (CELS) and Multilingual Studies (MUST), which was implemented in 2003 at the School of Language and Communication Studies of the University of Limpopo (Ramani & Joseph, 2006:4). According to Ramani and Joseph (2006:4), coordinators of this dual-medium BA degree, “[t]he degree represents a model of additive bilingualism as it develops students’ competence in English while simultaneously developing their knowledge and use of their home language for higher-order cognitive work”. Nevertheless, indigenous languages remain underrepresented as languages of learning and teaching. Although English clearly supersedes all other official South African languages as a language of learning and teaching, the level of English academic literacy among South African learners is far from optimal. This will be dealt with in the next section.

2.2.3 Language and education

Before the issue of low English academic literacy levels among South African university students can be discussed, it is necessary to make clear the connection between English language proficiency and English academic literacy.

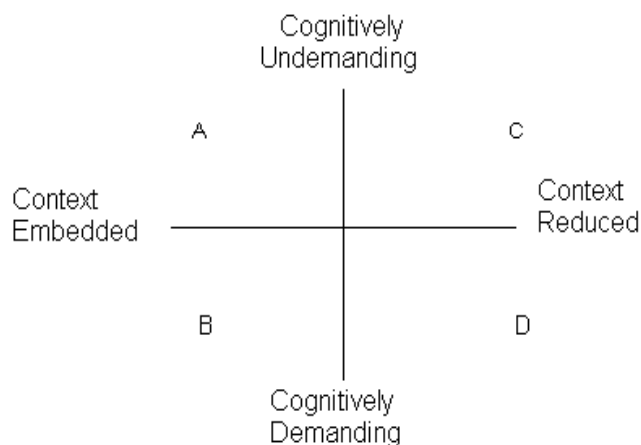
2.2.3.1 English language proficiency

Cummins’ distinction between BICS and CALP is useful when discussing second language proficiency. In the context of his earlier work on second language proficiency, Cummins (1991:169-170) distinguished between two levels of language proficiency, known as Basic Interpersonal Communicative Skills (BICS) and Cognitive Academic Language Proficiency (CALP), as mentioned in Chapter 1. More specifically, BICS refers to “the manifestation of language proficiency in everyday communicative contexts” and CALP to “the

manipulation of language in decontextualised academic situations” (Cummins, 1984:137).

Subsequently, he elaborated these concepts, out of a concern that the BICS/CALP categorisation of language proficiency “oversimplified the phenomenon”, which could lead to misinterpretation (Cummins, 1984:138; Cummins & Swain, 1986:152). However, Cummins’s new framework retains the basic aspects of the BICS/CALP distinction. It states that language proficiency can be conceptualised along two continuums (see Figure 2): one continuum relating to the range of contextual support available for producing or understanding meaning and a second continuum relating to the degree of cognitive involvement required in a specific communicative situation (Cummins, 1984:138-139). At the top of the vertical continuum are the communicative activities in which the linguistic tools have been mastered and therefore imply little cognitive involvement. At the bottom are the communicative activities in which the linguistic tools have not yet been mastered and therefore require a high degree of cognitive involvement. Cummins (1984:139) states that writing an essay is an example of situation D, in which the contextual support available is minimum and the cognitive involvement is high, which requires that the linguistic tools be adequately mastered. Should they not be mastered, a learner will find activities such as writing an essay (or any academic text, for that matter), which are an integral part of academic requirements, very difficult to complete and their performance will suffer.

Figure 2: Range of contextual support and degree of cognitive involvement in communicative activities



(Cummins, 1984:139)

This shows that Cummins's new framework indeed retains the basic aspects of the BICS/CALP distinction, insofar as it argues that a high level of linguistic mastery is essential in order to accomplish tasks that require high cognitive involvement (such as academic tasks), and that should this high level of linguistic mastery not have been reached, the learner may struggle to achieve what is expected of him/her.

In her study on subtitles as an aid in academic literacy programmes, Ayonghe (2009:36) draws a parallel similar to that of Cummins's BICS and CALP, between Language Proficiency and the notion of Academic Language Proficiency (ALP). Based on two definitions of Academic Language Proficiency by Chamot and O'Malley (1994:40) and Bailey, Butler, LaFamenta and Ong (2004:6), Ayonghe (2009:36) defines ALP as a specialised notion of language proficiency and as pertaining to "a person's level of language ability that makes it possible for him/her to function effectively in an academic environment". The notion of ALP, like the notion of CALP, stands in contrast to a more informal language that learners may use for everyday communication, when not in an academic situation.

2.2.3.2 English Academic literacy

In the same study, Ayonghe (2009:25-35) also distinguishes between the notions of “literacy” and “academic literacy”. For the purpose of her study, she chooses to define literacy as the general ability to read and write (Ayonghe, 2009:28), although she clearly states that many different definitions have been suggested by scholars. On the other hand, academic literacy is defined as the type of literacy that is necessary to succeed in an academic environment (Ayonghe, 2009:28). Again, Ayonghe acknowledges the fact that academic literacy has been attributed a number of different definitions. However, it is interesting to note that she focuses on definitions highlighting the strong contextual character of academic literacy practises, as well as the fact that academic literacy is connected to specific disciplinary contexts (Ayonghe, 2009:29).

Thus, the connection between language proficiency and academic literacy lies in the fact that academic literacy refers to a set of academic skills required so that learners can access, process and produce information (Weideman, 2003:xi) in the context of their chosen subjects within the academic domain. Basic language proficiency, therefore, forms part of academic literacy in the sense that it is one of the most basic requirements of being academically literate. In other words, without a basic, adequate level of proficiency in a language, it may be very difficult for students to acquire the more specialised and contextualised discourse of specific disciplines at a university.

2.2.3.3 Low levels of English language proficiency in South Africa

Foley (2004:57), Weideman (2004:1), Coetzee-Van Rooy and Verhoef (2000:164) and Butler and Van Dyk (2004:1) point out that many higher education students do not have a good enough command of English to be able to successfully complete their studies in these languages. The Language Policy for Higher Education (Ministry of Education, 2002:4-5) acknowledges the problem by stating that “Language has been and continues to be a barrier to access and success in higher education; both in the sense that African and

other languages have not been developed as academic/scientific languages and in so far as the majority of students entering higher education are not fully proficient in English and Afrikaans”.

The fact that many South African learners (with the exception of Afrikaans L1 learners) go through most of their schooling in English – i.e. up to 12 years of schooling for learners taking English as a first or additional language and at least 8 years as a language of teaching and learning for learners studying English as an additional language (Young, 1995:66) – therefore does not seem to be a guarantee that the learners will be proficient enough in the language in order to study successfully at tertiary level. One may therefore wonder why the level of proficiency in English is not high enough among EAL learners, despite the fact that they have gone through most of their schooling in English. Three main reasons can be identified according to the literature available on the topic.

The first reason is that South African learners do not enjoy the opportunity to be taught in their mother tongue, despite the fact that mother-tongue instruction is recognised as a right by the South African Constitution. Studies have also shown that a sound basis in the mother tongue is essential for the acquisition of additional languages. For instance, in her article on an African linguistic Renaissance, Moodley (2000:105) highlights the importance of mother-tongue instruction in the early stages of education by referring to a 1951 UNESCO resolution, which declared that “it is axiomatic that the best medium for teaching a child is the child’s mother tongue”.

The work of Canadian researchers Cummins and Swain (1986) corroborates this: they argued that learners are more likely to become proficient in a second language if they are already proficient in their mother tongue and that intellectual performance is affected negatively when the mother tongue is neglected to the profit of additional language acquisition. From the point of view of second language acquisition, Cummins argued that learners would not be able to cope with the demands of tertiary education if they had only acquired BICS in the language of teaching and learning.

Many South African EAL learners find themselves in this situation throughout their education. Although they may be able to use English for the purpose of everyday social communication, after having spent 8 to 12 years of their primary and secondary schooling learning English as an additional language and/or using it as a language of learning and teaching, this level of proficiency is not adequate for successful learning at higher education level.

In the context of their study on the perception a group of Southern Sotho speakers had of their own English proficiency, Coetzee-Van Rooy and Verhoef (2000:175) identified a discrepancy between these perceptions and the actual proficiency of the respondents. Indeed, it seems that the respondents perceive their proficiency as being higher than it actually is. Coetzee-Van Rooy and Verhoef (2000:180) argue that one of the reasons for this discrepancy is that the respondents have a conception of the notion of proficiency that is somewhat different from that put forward by Cummins (1984, 1986), for instance. Indeed, they state that the respondents may consider intranational communication as the primary purpose of learning English, and that their conception of proficiency is therefore related to the ability to communicate socially with other South Africans, and not the ability to use English in academic situations. However, according to Weideman (2003:62), the language used for academic purposes is different from that used for everyday communication. The fact that academic situations require the use of a language different from that used in everyday communication is also acknowledged by Ayonghe (2009) and Coetzee-Van Rooy and Verhoef (2000). The difference between the language used for everyday communication and academic discourse is that the latter selects certain features of language which are combined in a specific way to make up what we refer to as language for academic purposes.

Proficiency in the mother tongue is often a precursor for proficiency in a second language and can therefore influence academic performance where the second language is used as a language of learning and teaching. This idea highlights the importance of the mother tongue in the education of many South African learners (Coetzee-Van Rooy & Verhoef, 2000:167). Indeed, in

the South African context, many EAL learners find themselves in a situation where they struggle academically due to the fact that they have not mastered adequately the English linguistic tools necessary for the successful completion of their tertiary studies (Coetzee-Van Rooy & Verhoef, 2000:175; Butler & Van Dyk, 2004:1). This is partly due to the fact that most of them did not enjoy the opportunity to be educated in their mother tongue. Weideman and Van Rensburg (2002:157) warn that “the lack of initial mother tongue education in many African countries will eventually result in lower literacy levels, and will have consequences that are nothing short of an educational disaster”.

The negative impact of second-language instruction is also emphasised by Heugh (2000:23-24), who argues that children are expected to learn through the use of an unfamiliar language much too early, even before literacy in the first language is well-developed. As a result, she argues, both their academic performance and linguistic development, whether in the first or the second language, are poor compared to those of learners whose home languages are English or Afrikaans, because the latter enjoyed mother tongue education throughout. Heugh (2000:24) also hints at another problem, the training of educators, which forms the second reason for the lack of English proficiency in South African EAL learners.

Talking about the advantages enjoyed by learners whose home languages are English or Afrikaans, Heugh (2000:24) mentions the opportunity to study an additional language taught by teachers who have obtained a suitable qualification in teaching that specific language. This can be interpreted as an allusion to the fact that some educators are not appropriately trained when it comes to language teaching. Barry (2002:107) confirms this by stating that some EAL educators are not trained well enough and that their knowledge of English (as well as their subject knowledge, she argues) is inadequate, while Uys *et al.* (2007:69) reproach teachers of English as an additional language for their lack of attention to the teaching of the four language skills (listening, speaking, reading and writing). Weideman and Van Rensburg (2002:160) rise to the defence of teachers in that respect, but do criticise them for not actively

applying the new methods and curricula that were created in order to deal with the problem of low language proficiency.

However, it seems that the competence of language educators is not the only factor to be taken into account: indeed, Weideman and Van Rensburg (2002:160) argue that teachers often find themselves with their hands tied when it comes to fulfilling parents' and government's expectations in terms of second language teaching, for the reason that they may have very limited control over certain factors that have created barriers for the learners before they even arrive in class, such as the fact that English is perceived as the language of economic empowerment and upward social mobility by learners' parents. As a result, pressure is put on the educators to make use of English as the language of learning and teaching, as opposed to the learners' mother tongue.

The third reason is the influence of the socio-economic background of learners. Barry (2004:107) and Pretorius (2002:93) state that socio-economic background is a factor in terms of reading ability, both in a home and a school context: learners coming from disadvantaged communities have low reading levels compared to learners coming from higher socio-economic backgrounds, due to the fact that the latter promote the development of reading skills. In the case of a low socio-economic status, learners may not have access to enough English-language material at home (whether it is books, radio or television), that would help them improve their language proficiency (Barry, 2004:108). As far as the school environment is concerned, Elley and Mangubhai (1992:56) claim that there is a direct link between school reading resources and learners' literacy levels. So, if the school does not have the financial means to purchase the relevant reading material, the learners' reading proficiency will suffer. Moreover, reading is said to improve language proficiency (Pretorius, 2002:94). It therefore stands to reason that socio-economic status, by either promoting or impeding the development of reading skills, also influences language proficiency. However, the socio-economic background of learners also influences English proficiency in a different way: English has acquired such a status as an international language that many

EAL learners' parents tend to think of it as a language of upward mobility as well as providing professional and economic opportunities, to such an extent that they dismiss mother tongue education altogether (Coetzee-Van Rooy & Verhoef, 2000:175-176; Barry, 2004:108; Foley, 2004:60; Webb, 2002:8).

In this section, three possible reasons for low levels of English proficiency in EAL learners have been highlighted: the lack of mother tongue education, the inadequate training of educators and the socio-economic background of learners. Young (1995:66) also mentions “ineffective language teacher training”, “low learner motivation”, “overcrowded classrooms” and “poor resources” as common explanations. However, he suggests that these may fail to identify the root of the issue and is of the opinion that the lack of mother tongue education for many South African learners is the main reason for low levels of English proficiency in EAL learners.

2.3 The development of receptive AL abilities

In the context of this study, receptive AL abilities are defined as reading and listening comprehension. In Weideman's (2003) functional view of being academically literate referred to earlier, reading and listening ability form part of the dimensions of accessing and processing information by means of a specific language of learning.

This study investigates a method in order to help EAL students access and process the content of lectures presented in English better. It is therefore essential to discuss the development of both reading and listening abilities, since they are essential for learning to take place: students have extensive reading to complete at tertiary level in order to integrate the relevant knowledge and skills (Pretorius, 2000:35; Nel, Dreyer & Klopper, 2004:95), while lectures are supposed to “instruct by conveying information in such a way that a coherent body of information is presented, readily understood and remembered” (Chaudron & Richards, 1986:114). However, the information presented during lectures is not always readily understood and remembered, which is why this study investigates the use of SLS via respeaking in the

classroom. It is anticipated that the SLS will act as learning support in terms of the accessing and processing of information and thus help students understand the content of the lecture better.

In this section, the development of reading and listening ability and their relationship with academic success will be discussed.

2.3.1 Receptive AL abilities (reading and listening ability)

Before discussing the development of receptive abilities, it is necessary to define the processes involved in the acts of reading and listening, specifically when the purpose of these acts is learning.

2.3.1.1 Reading ability

Pretorius (2002:91) states that reading involves two main components: decoding and comprehension. Pretorius (2002:91) defines decoding as “the oculomotor, perceptual and parsing aspects of reading activity whereby written symbols are translated into language” and comprehension as “the overall understanding process whereby meaning is constructed within sentence units, between adjacent sentences, and across larger units of text to the meaning of the text as a whole”. Decoding is a skill that needs to have been mastered if comprehension of the text is to occur. But although it is a necessary skill, it is not sufficient, for reading would be meaningless if the message was not understood.

According to Pretorius (2002:92), comprehension is “the *sine qua non* of reading”. This view is supported by Burgoyne, Kelly, Whiteley and Spooner (2009:736) who, in the context of a study on the reading and listening comprehension of English Additional Language learners in the UK, state that effective reading involves more than decoding print and that the primary purpose of reading is to understand the text. Therefore, good or poor reading ability is defined in terms of good or poor comprehension (Pretorius, 2002:92).

2.3.1.2 Listening ability

According to Wolvin and Coakley (1985:74), listening is "the process of receiving, attending to, and assigning meaning to aural stimuli". Oxford (1993:205) adds that listening involves a transformation of "input" into "intake", i.e. a transformation from "noise" into a meaningful message. These definitions imply that listening is not a passive activity, despite the fact that it has been considered as such in the past (Vandergrift, 2004:3).

On the contrary, it requires an active involvement on the part of the listener. Vandergrift (2004:3) states that the perception of listening as a passive activity has changed and that listening is now recognised as an active process. Smit (2006:14) further defines listening as "an active process involving hearing, understanding, integrating and responding". Indeed, effective listening is more and more widely considered as a skill that needs to be taught and acquired and that involves a number of conscious, purpose-driven processes on the part of the learners (Vandergrift, 2004:3-4). For instance, the learners must be able to "discriminate between sounds, understand vocabulary and grammatical structures, interpret stress and intonation, retain what was gathered in all of the above, and interpret it within the immediate as well as the larger sociocultural context of the utterance" (Vandergrift, 1999:168).

Like reading, listening involves a decoding component and a comprehension component. As such, it does not only consist in recognising or understanding individual words or groups of words, but also in understanding the message delivered by the speaker (Smit, 2006:14). This is especially true in the tertiary academic context, where information is conveyed orally in lectures.

2.3.2 The development of receptive abilities

Although reading and listening ability may be used for a variety of pursuits, such as entertainment, relaxation, study or work, this section focuses on the role of reading and listening abilities for the purpose of learning. Indeed, both

reading and listening abilities are essential for learning purposes.

2.3.2.1 The development of reading ability

Pretorius (2002:92) differentiates between the processes of “learning to read” and “reading to learn”, while Vandergrift (2004:3) differentiates between “learning to listen” and “listening to learn”. The expressions “reading to learn” and “listening to learn” imply that both reading and listening are skills that allow learning to take place, insofar as they make access to oral or written information possible. It is therefore essential that both abilities be developed on an ongoing basis, since the students’ academic results are dependent on them.

In the South African schooling context, learning to read takes place in the following way, as Pretorius explains in her article *What they can't read will hurt them: Reading and academic achievement* (2000): reading skills are usually developed in the first four years of schooling using storybooks in the learners’ mother tongue. At this stage, the emphasis is on the development of decoding skills. However, beyond Grades 1 to 3, South African learners do not seem to be encouraged to hone their reading skills (Pretorius, 2002: 93). The reason for this is that it is generally assumed that once learners know how to decode a text, comprehension will naturally follow. More attention is therefore dedicated to decoding skills than to comprehension skills (Pretorius: 2004:47), although it is the latter which make reading a meaningful activity. Pretorius (2000:34) argues that although many learners have adequate decoding skills, they display poor comprehension skills, and struggle to understand what they read. The gap between decoding and comprehension is therefore not automatically bridged by all learners.

As a result, learners are not yet ready to “read to learn”, and find it difficult, if not impossible, to cope with the upgrade of the reading material from narrative texts to expository texts. This represents a handicap for learners throughout their primary and secondary schooling, and particularly at tertiary level.

This situation is especially problematic for additional language learners, insofar as they have to acquire language and reading skills in a second language in order to be able to read to learn. If their reading skills in their mother tongue are not adequate, as is often the case due to the general lack of encouragement to develop their reading skills beyond the decoding stage, learners will have few comprehension skills to transfer to reading in the additional language, English. This is made worse by the fact that most of these AL learners come from a culture based on oral rather than written communication (Pretorius, 2002:93). Pretorius (2004) adds that this issue also applies to the school teachers themselves: indeed, many primary school teachers come from communities that privilege an oral form of culture, and therefore may not be proficient readers themselves. Moreover, they may not be familiar with “the traditions of storybook reading or books for young people” (Pretorius, 2004:58).

However, South Africa is not the only country where EAL students are deemed to display inadequate reading skills: the results of studies carried out in the United Kingdom have shown that EAL students in British schools do not fare as well as their L1 peers either in terms of reading ability (Burgoyne *et al.*, 2009:735-736).

Pretorius (2004:47) identifies several factors in the underdevelopment of reading abilities in the South African context, which she relates to the socioeconomic context in which the individual learners find themselves, specifically the home environment and the school environment. In an underprivileged home environment, learners may have little or no access to reading material, and/or may not be encouraged to seek out reading opportunities. It is in such a situation that the school environment takes on all its importance, by providing the support learners may not have at home (Pretorius, 2004: 47).

However, there are a number of factors in the school environment that may prevent it from fulfilling its supportive role, like poor school resources (especially in terms of adequate reading material), an inadequate amount of

time dedicated to reading activities in class, a possible lack of qualifications, training or experience on the part of the educator and also the absence of standardised reading tests, which makes it difficult to find out whether learners have indeed reached the reading levels to be expected at a specific grade level (Pretorius, 2004:47), and thus to put a remedial strategy in place. Inadequate reading levels will then lead to reduced access to the curriculum and an inability to reach the individual's full potential (Burgoyne *et al.*, 2009:736).

It therefore stands to reason that acting on the above-mentioned factors may help the learners improve their reading skills. According to Pretorius (2002:98), the act of reading indeed seems to be the best way to improve reading skills. But this is not its only advantage: reading also promotes language proficiency, and “has been found to be a powerful means for improving proficiency in an additional language, especially the cognitive-academic language proficiency that is highly valued in the learning context”.

2.3.2.2 The development of listening ability

Although Pretorius (2002:93) argues that many learners are not encouraged to improve their reading comprehension as opposed to their decoding skills beyond Grade 4 and although she bemoans the fact that research on reading in South Africa is limited (Pretorius, 2002:98), it seems that listening skills tend to receive a lot less support and that listening comprehension is expected to develop by itself (Smit, 2006:10). Dunkel (1991:434) deplores the lack of research and understanding when it comes to first and second or foreign language listening, when it is, in her opinion, “vitally important for an individual’s survival and prosperity in interpersonal relationships, and in the academic and corporate environments”.

Focusing on the importance of listening in the academic environment, Rost (1994:141-142), Vandergrift (2004:3) and Oxford (1993:206) have emphasized the importance of listening in the classroom because it

represents a source of input, i.e. of learning, for the learners (Rost, 1994:141-142).

There is therefore a real need for listening instruction, especially since, among all four language skills (speaking, reading, writing and listening), listening is the most difficult to learn, due to the fact that it is the “least explicit” of all four skills (Vandergrift, 2004:4). Oxford (1993:206) supports this view by stating that inadequate listening skills have been proved to be a stronger factor in failure at tertiary level than inadequate reading skills.

Although recent research, however limited, has accepted the role of listening as essential in an academic environment, Dunkel (1991:434) points out that scholars have not yet reached a consensus about the way in which listening actually works. Vandergrift (2004) and Oxford (1993), among others, have attempted to provide answers as to the way in which listening operates. Vandergrift (2004:4) states that listening involves both physiological and cognitive processes and highlights the essential role played by “bottom-up” and “top-down” processes. “Top-down” processes come into play when the listeners resort to context and prior knowledge in order to comprehend concepts presented to them orally. On the other hand, “bottom-up” processes refer to the way in which listeners construct meaning by “combining increasingly larger units of meaning from the phoneme-level up to discourse-level features”. He concludes by pointing out that it is in the interest of EAL listeners to learn to use these processes to their advantage. The question remains, however, what the best strategy for achieving this would be.

Recent research on listening has therefore focused on strategies for efficient listening for EAL students (Oxford, 1993; Strauss, 2004; Vandergrift, 2004; Smit, 2006). In his review of empirical studies on listening instruction, Vandergrift (2004:5-8) mentions strategies such as the use of advance organizers (i.e. sentences in the second language provided to the learners in the form of oral or written summaries or questions, for instance, so that they can prepare themselves for a specific listening activity) and of subtitled DVDs, as well as the use of teaching methods aiming at enhancing bottom-up skills

and at raising “the metacognitive awareness of listening”. Oxford (1993:208-209) refers to a number of strategies to help EAL students infer meaning from an oral message in the additional language:

- The simplification of EAL input, which consists in simplifying the audio material for the sake of EAL learners.
- Attention in EAL listening comprehension. Although it may seem obvious that paying attention to EAL audio input is essential for comprehension to take place, Oxford (1993:208) argues that “50% of EAL students are attending to the content of a lesson at any given moment”, which implies that the remaining 50% are not focused on the EAL input. Oxford (1993:208) adds that attention is “central to the entire process of second language acquisition”.
- Adapting the listening behaviour to the purpose of listening. According to Oxford (1993:208), different EAL listening activities require different types of listening behaviours from the learners (listening for details, listening for the main idea, critical listening, etc.). It is therefore essential that the learners be aware of the kind of listening they are expected to do in the context of a specific activity, so that they can adapt their listening behaviour accordingly.
- Practising the memory to remember the oral discourse better. The better the EAL learner’s memory, the better he or she will be able to remember what was said. Memory training, through mnemonic strategies for example, is therefore essential for increased performance as far as listening is concerned.
- Monitoring one’s own EAL comprehension. It is beneficial for EAL learners to engage in regular monitoring of their own comprehension by making predictions concerning the content of the audio input and evaluating the accuracy of their predictions.
- Dealing with the affective aspects of EAL listening. This refers to the fact that EAL listening tasks often are a source of anxiety for EAL learners, because the latter tend to lack confidence as far as their listening abilities are concerned. Oxford (1993:209) points out that anxiety causes EAL learners to fail to transfer coping skills from the

first language to the second language and therefore hinders performance. Adopting anxiety-reducing techniques may thus help improve listening comprehension.

In the context of this study, the students will be exposed to subtitled lectures in order to optimise the time spent listening to lectures. The subtitles will be produced both live via respeaking and offline, in English. Although the purpose of this study is not specifically to help the participants improve their listening skills by applying any of the specific strategies mentioned above, it is anticipated that the presence of the SLS should enable the participants to focus their attention on the content of a lecture in terms of demarcating their specific purpose for listening, as well as to monitor their own comprehension of the lecture content by providing a written transcription of the oral message. In addition, because of the nature of the language of subtitling, the often less structured oral language of lectures will be simplified. The fact that students will also be expected to complete evaluations on the subtitled lectures will provide further motivation for developing memory strategies. Therefore, most of the above strategies will receive attention in these interventions even if the strategies are not implemented explicitly.

2.3.3 Reading and listening ability and academic performance

It is essential for EAL students to enhance their reading and listening ability, as suggested above by Vandergrift and Oxford, because both abilities have been proved to be closely linked to academic achievement (Saville-Troike, 1984; Wells, 1986; Pretorius, 2004; Oxford, 1993; Vandergrift, 2004; Rost, 1994). Pretorius (2004:94), for instance, argues that poor reading ability is a fundamental factor as far as academic underachievement is concerned, while Oxford (1993:206) points out that deficient listening skills are an even stronger factor than deficient reading skills as far as academic achievement is concerned. Research has shown that effective listening comprehension skills are vital for students to achieve academic success (Smit, 2006:10). However, which of the two skills is the most important is a debatable issue (researchers do not seem to have reached an agreement in that respect) and is beyond the

scope of this study. It may be more constructive to highlight the crucial role each skill plays as far as academic performance is concerned.

Burgoyne *et al.* (2009:737) state that there is considerable evidence of a single comprehension system which underlies the comprehension of both written and oral text. They explain this by stating that before children learn to read, their language comprehension system develops through oral language experiences. So when they start learning to read, they actually learn how to access this same comprehension system via the written code.

The importance of listening skills can be explained by the fact that, if one considers the tertiary education environment, a large amount of input is provided orally, during lectures. Flowerdew (1994:7) confirms this by pointing out that lectures are among the most important aspects of learning at university level, and Oxford (1993:206) adds that students at university level spend close to 90% of class time listening, whether to discussions or lectures. It therefore makes sense that the more efficient the listening skills of students are, the better students are likely to understand and retain what was said during a lecture.

It should also be mentioned that, although many students may struggle with listening, even in their own language, EAL students are likely to find themselves in an even more problematic situation. Strauss (2004) acknowledges the issue of EAL⁵ listening in an article discussing the listening difficulties of mainstream EAL students at the Auckland University of Technology (AUT) in New Zealand. In this article, Strauss (2004:91) comments on the fact that even though these EAL students have passed English language proficiency tests or have even attended school in New Zealand, many have not yet attained the required level of proficiency in English. As a result, EAL students may find themselves unable to follow what is being said in class (Strauss, 2004:92). Indeed, Brett (1997:39) points out that language learners find it more difficult to master the skill of listening

⁵ Strauss actually uses the acronym L2 to refer to the second language. However, for the sake of consistency, L2 will be referred to as EAL throughout this study.

compared to their first-language counterparts, while Young (1994:159) states that the same is true of EAL students, who experience difficulty “in processing academic discourse”.

On the Vaal Triangle Campus of NWU, the majority of students are EAL students, as mentioned in Chapter 1. In 2007, almost 90% of students on this campus did not speak English as a mother tongue (Verhoef, 2009:2). With around 30% of students studying through the medium of Afrikaans as their mother tongue, this means that around 60% of the students on campus could be considered EAL students. The mere fact that these students are studying through an additional language may, according to Young (1994:159), lead to their having difficulties processing academic discourse. This problem is further compounded by the fact that many of these students have not reached an adequate level of academic literacy in English, as the TALL results show (Verhoef, 2010:1). However, in some cases, inadequate listening skills alone cannot be blamed for the lack of comprehension of lecture content. Indeed, accent is often considered as one of the factors having a negative impact on the comprehension of lectures for EAL students (Flowerdew, 1994:24). Flowerdew (1994:24) acknowledges the fact that EAL students are likely to be exposed to a variety of native and non-native accents, and that unfamiliar accents do cause comprehension problems.

This is especially likely in a country like South Africa, where 11 national languages are spoken and where English is the main language of learning and teaching at tertiary level although it is only spoken as a first language by 8.2% of the population, according to the latest available census statistics (2001). Indeed, it is common for lecturers as well as students to speak English as an Additional Language and because EAL is spoken with a variety of different accents in South Africa, depending on the origin of the individual speakers, it stands to reason that South African EAL students will at some point in their university career be taught by a lecturer with a non-native accent. As a result, students may struggle to understand this specific lecturer's discourse, especially if the lecturer's accent is unfamiliar.

Flowerdew (1994:24-25) adds that the impact of accents on comprehension has clear implications as far as pedagogy is concerned: EAL students are more likely to understand the lecturers who have the same language background, or whose accent is closest to the accents students have been exposed to in the context of their studies or in daily life. It may therefore be beneficial to ensure that the language background of the lecturers teaching in English is as close as possible to that of the students. However, this is not always possible, and in this case, Flowerdew (1994:25) suggests that “students should be exposed to few lecturers over a longer period rather than many lecturers over a shorter period, so as to allow students to develop familiarity with their accents”. The fact that subtitles neutralise accent therefore also holds benefits in this context, although matters of reading proficiency then become an important consideration.

According to Pretorius (2000:35), there is a strong correlation between reading proficiency and academic success at all ages, to the extent that “all academic achievement depends to a lesser or greater extent on academic literacy” (Pretorius, 2004:45). This relationship between reading ability and academic performance exists from primary up to tertiary level and is reflected in the fact that proficient readers usually obtain good grades (Pretorius, 2002:94).

Saville-Troike (1984:199) adds that the relationship between reading ability and academic achievement is especially strong as far as EAL learners are concerned. However, Pretorius (2002) deplores the fact that the reading skills of many South African learners are highly inadequate. This, she argues, is not only symptomatic of primary and secondary schools, but is also evident at tertiary level, and applies to students studying through their mother tongue as well as students studying through the means of an additional language (Pretorius, 2002:93). It therefore stands to reason that, considering the amount of reading students are required to complete at tertiary level, students who have an inadequate reading ability would find it difficult, if not impossible, to complete their tertiary studies successfully. In the context of subtitling, reading skills are therefore important, and could even be considered a

constraint, although, subtitles have been shown to hold benefits in terms of reading practice and comprehension as will be discussed in section 2.5 below.

This section highlighted the importance of reading and listening ability for all learners, whether they are taught in their mother tongue or in an additional language. However, it can be concluded that these receptive abilities play an even more crucial role for the latter.

2.4 The impact of EAL on academic performance

Research carried out in the UK and South Africa (Burgoyne *et al.*, 2009 in the UK; Boughey, 1994; Barry, 2002; Van Dyk & Weideman, 2004; and Uys *et al.*, 2007 in South Africa) has shown that students who study through an additional language have a distinct disadvantage compared to their L1 peers in terms of academic performance, regardless of the stage of education. Burgoyne *et al.* (2009), for instance, investigated the reasons why, according to data yielded from national test results, children in UK schools who have English as a first language experience higher rates of educational attainment than children learning through EAL at each stage of education. In order to do so, they focused on the literacy skills (reading and comprehension-related skills) of a group of EAL learners of Asian origin (2009:737). The results of the study showed that the difficulties of EAL learners may be linked to lower levels of English vocabulary, which interfere with reading and listening comprehension (2009:742), and in turn have a negative impact on academic performance.

In South Africa, it has also been proved that EAL learners do not fare as well as English mother-tongue learners in terms of academic performance, (Van Dyk & Weideman, 2004; Barry, 2002; Uys *et al.*, 2007), due to the fact that many of the former have not reached the level of English proficiency that would allow them to study successfully at tertiary level. According to Van Dyk and Weideman (2004:1), “low academic language proficiency levels have indeed been mooted as one of the primary causes of the lack of academic

success experienced by many students at South African universities”. This statement is corroborated by Barry (2002:106) and Boughey (1994:22) who highlight the fact that language and achievement are linked and that, as a result, it is language, more than the actual content of the course material, that represents an obstacle to learning if the language of learning and teaching is not mastered.

The use of English as a language of learning and teaching by the majority of AL learners in South Africa should therefore be considered as an essential factor that causes these learners’ poor performance across the board. One could thus justifiably argue that, if students who are required to study and to carry out assessment tasks using English are to succeed, proficiency in English is essential. The fact that students did not master English at a sufficient level has a negative influence on academic performance, because English is the main language of learning and teaching at higher education level in South Africa (Uys *et al.*, 2007:69). The reason for underperformance in EAL students is thus not necessarily cognitive in nature, but rather linguistic.

The problem regarding students entering university with low levels of English academic literacy appears considerable: Weideman (2003:56) states that approximately a third of students at the University of Pretoria are identified as being at risk of not completing their studies due to low levels of English academic literacy. The University of Pretoria is, however, not alone in their realisation of the fact that academic literacy levels among students are indeed problematic.

On the Vaal Triangle Campus of North-West University, for instance, where this study will be carried out, students who will be studying through medium English are required to sit an academic literacy test (TALL) at the start of the academic year. This test is currently employed by three South African universities – NWU, Stellenbosch University (SU) and the University of Pretoria (UP) – in order to measure the AL levels of new first year students. As its name indicates, the test serves to measure the level of English

academic literacy of the students. The students who fail the test are considered at risk of failing their studies and are therefore required to register for a compulsory English academic literacy module (AGLE 111) in the first semester of the academic year. All new first year students (regardless of whether they passed the literacy test or not) are then required to register for a more advanced academic literacy module (AGLE 121) offered during the second semester.

According to an analysis of the TALL results on the Vaal Triangle Campus from 2003 to 2010 (Verhoef, 2010 - see Table 1 below), the average score for the TALL has been below the cut-off point (50%) every year. One may be tempted to conclude that the level of English academic literacy among students studying through medium English on the Vaal Triangle Campus is not adequate, and that students are likely to experience difficulties to cope with the course content. This might in turn affect their academic performance. This having been said, it should however be kept in mind that, as mentioned in section 1.2.3.1, the TALL and TAG are not standardised and that their level of difficulty could actually increase substantially from year to year.

Table 1: Average scores for the TALL on the Vaal Triangle Campus from 2003 to 2010

English placement test (TALL)	2003		2004		2005		2006		2007		2008		2009		2010	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
	140	47	330	37.8	495	43.3	365	40	445	36.4	499	37.8	587	41.8	989	45.7

(Verhoef, 2010:1)

2.5 The benefits of AV material and SLS in the EAL classroom

The previous section dealt with the impact that studying through English as an additional language may have on the performance of South African learners and concluded that the levels of English academic literacy of South African EAL students are often not adequate for university study, and that the academic performance of the latter suffers as a result.

Insofar as the purpose of this study is to show that same-language subtitles (SLS), both live via respeaking and offline, may help improve first year students' English academic literacy levels, and, as a consequence, the general access to and processing of information, this section first provides background information on the benefits of offline SLS as learning aids for EAL students, and then on the benefits of live SLS via respeaking in the same context.

2.5.1 The benefits of offline SLS

Originally, the intended role of SLS was to provide access to audiovisual material for deaf or hard-of-hearing persons. However, further studies have shown that SLS can also be used for other purposes, such as literacy training, vocabulary acquisition, listening and reading comprehension, language acquisition and language proficiency training and communication (cf. Ayonghe, 2009:54). It is however beyond the scope of this study to discuss all of the aforementioned purposes in detail. Instead, although the other purposes will be mentioned briefly, the focus will be on academic literacy and in particular the receptive abilities involving reading and listening comprehension.

Various studies have proved that AV material in general has benefits in an educational context and that it is more and more commonly used as an educational tool. Neves (2004:129) confirms this by stating that "conventional education systems have found the resourcefulness of audiovisual material

and have gradually brought them into the classroom”. It therefore makes sense to introduce subtitles, as an aspect of AV material, in the classroom, to serve as a further learning aid. There are indeed various reasons why subtitles and more specifically same-language subtitles (SLS), since they are the focus of this study, may be considered as a method of facilitating access to lecture content for EAL students.

First of all, several studies conducted over the past twenty years have shown that SLS have specific educational benefits, especially in terms of literacy and comprehension. Indeed, SLS have been found to:

- Improve **listening comprehension** (Bird & Williams, 2002; Garza, 1991; Ayonghe, 2009) and more specifically the listening comprehension of native-English speech patterns in EAL learners.
- Improve the **reading and listening comprehension of university-level students** specifically (Garza, 1991). Huang and Eskey (2000) also report that captions improve university-level ESL students’ general reading comprehension, vocabulary acquisition and listening comprehension. These findings have a direct bearing on the current study.
- Improve **general comprehension**: the performance of bilingual students increases substantially in terms of word identification, word meaning and content learning assessments (Neuman & Koskinen, 1992:103-104). SLS also increase comprehension by unlocking accents, dialects and humour, as well as drawing the learners’ attention to unfamiliar phrases and words (Vanderplank, 1988, 1990).
- Improve the **comprehension of English audiovisual material** and more specifically films (Markham, 1993:183-184 and 1999:321, 326-327; Vanderplank, 1988, 1990).
- Facilitate **second-language acquisition** (Koolstra & Beentjes, 1999; Kothari, Takeda, Joshi & Pandey, 2002; Ayonghe, 2009).
- Improve **literacy skills**, especially when used with TV programmes, by providing viewers with hours of reading practice, while being involved

in a pleasant activity such as watching TV (Kothari *et al.*, 2002; Gottlieb, 2005).

- Improve **overall academic literacy** (Ayonghe, 2009). In her study of subtitling as an aid to academic literacy at the University of Buea in Cameroon, Ayonghe (2009:110-111) concludes that data points towards a statistically significant improvement in academic literacy in the students who were exposed to subtitled films and documentaries.
- Increase **access to teaching material** for students who use different types of learning strategies by presenting speech, text and supportive visual context simultaneously and can therefore be used with heterogeneous groups (Spanos & Smith, 1990). This finding implies that the multimodal aspect of SLS enhances learning.

The latter observation represents the second benefit of SLS: indeed, SLS provide a link between the auditory and the written representation of the lecturer's speech. Various studies (Bird & Williams, 2002; Caimi, 2006; Guillory, 1998; Danan, 2004; Garza, 1991; Parks, 1994) have shown that learners of a foreign or second language benefit from the double exposure (aural and written) to the learning material. Indeed, double exposure to the content reinforces the message contained in the AV material, the written mode complementing the aural one so as to facilitate comprehension and word recognition.

Following her study on the benefits of intralingual subtitles as a didactic aid for learners of English as a foreign language, Caimi (2006:86) contends that SLS facilitate learners' listening and reading comprehension, enhance retrieval of information and increase self-confidence. She adds that "the intentional combination of the phonological expression of the foreign language with its written form [...] acts as a complementary aid to language comprehension" (2006:87).

Bird and Williams (2002) carried out an experiment in order to investigate the benefits of SLS and to establish whether the double exposure (which they

refer to as "bimodal input" in the context of their study) indeed provide easier access to the target language and whether they definitely lead to greater comprehension and learning, as was previously stated by Vanderplank (1990; 1988) and Garza (1991), for instance. The results of their study allowed them to conclude that "learners of a foreign language may in some ways benefit from same-language subtitling and other materials which allow learners to read and hear simultaneously" (Bird & Williams, 2002:18), insofar as the written representation improves the recognition of words presented orally (Bird & Williams, 2002:17). Lambert, Boehler and Sidoti (in Guillory, 1998:90-91), whose work dealt with captioning in French, reached the conclusion that a "stable general trend indicating that information coming through two input forms – dialogue and scripts – is more thoroughly processed than if either dialogue or script is presented alone". Guillory (1998:91) proceeds to sum up this conclusion by stating that "information coming through two channels is better than one".

Danan (2004) too states that subtitles help students to visualise what they hear. He argues that subtitles are thus an effective mode for both language learning and language comprehension, and adds that "it leads to additional cognitive benefits, such as greater depth of processing" (Danan, 2004:67).

Garza (1991:246) justified the simultaneous use of second language audio and second language captions by stating that

[b]y providing students with a familiar (i.e., comprehensible) graphic representation of an utterance, they are empowered to begin to assign meaning to previously unintelligible aural entities, gradually building their aural comprehension in relation to the reading comprehension.

In her report on the use of captioned TV as a resource for ESL literacy, Parks (1994) describes a number of EAL classroom applications for offline SLS (not through respeaking) with a view to improving comprehension, literacy and vocabulary in the second language. This shows that SLS is considered as a valuable tool in terms of comprehension, literacy and vocabulary in the

second language. Parks (1994:2) adds that studies have confirmed what had already been discovered in previous studies, that is to say that “[s]tudents using captioned materials show significant improvement in reading comprehension, listening comprehension, vocabulary acquisition, word recognition, decoding skills and overall motivation to read”. In other words, the purpose of SLS is to help learners establish a link between the written words and their phonetic equivalent in the language. However, Garza concludes by suggesting that further research be conducted using other types of SLS, such as verbatim, paraphrase and keywords (1991:246).

Although the students involved in the current study are not learners of English as a foreign language, the majority of them are second-language, or additional-language speakers of English. In section 3 of this chapter, it was concluded that the levels of English academic literacy of many students at the Vaal Triangle Campus of North-West University, where the study was conducted, are not adequate. It can therefore be argued that if SLS allow foreign-language learners to enhance their comprehension of the foreign language, they could in the same way help improve EAL learners’ comprehension of the second language, i.e. English. This view is supported by Koskinen, Wilson, Gambrell and Neuman (1993:38), who suggest that subtitles are “a motivating medium for improving the vocabulary and comprehension skills of below-average readers and bilingual students”; and by Bain, Basson and Wald (2002:193), who state that SLS also benefit EAL students, because they tend to “struggle with lecture content delivered in auditory format, typically having greater exposure to English language in print form”.

2.5.2 The benefits of live SLS via respeaking

Before proceeding to discuss the benefits of live SLS via respeaking as a learning aid, a brief historical overview of respeaking and its various applications is provided here.

2.5.2.1 Historical overview of respeaking

Since the end of the 1990s, respeaking is a skill which has been increasingly sought after in the audiovisual industry (Lambourne, 2006:1). Its original purpose was to facilitate access to specific TV programmes such as news bulletins and sporting events for a deaf and hard-of-hearing audience. Subtitling companies internationally have started to use respeaking in order to create live subtitling for programmes such as news bulletins and sporting events for deaf and hard-of-hearing audiences. Because live events cannot be subtitled off-line, respeaking provides a way to add subtitles in real-time to these events: a "respeaker" repeats the speech of the presenter into speech recognition software (there are different software packages on the market, like Dragon Naturally Speaking, IBM ViaVoice, etc.) which transcribes the speech. As the speech recognition software transcribes the speech, the latter is checked for recognition errors. Indeed, no commercial speech recognition software can recognise all utterances 100% accurately, and some mistakes may occur. The transcription then scrolls horizontally at the bottom of the screen.

The BBC, for example, began subtitling sports. The first event to be subtitled live via respeaking was the World Snooker Championships in April 2001. Subsequently, respeaking was used in order to subtitle not only sport, but also BBC Parliament, regional news and later, national news on BBC News 24 (Marsh, 2006:2). Increasingly, though, respeaking has been used in an attempt to increase productivity in off-line subtitling. At Red Bee Media, the company catering to all the BBC's subtitling needs, for instance, respeaking is also used to produce offline subtitles (Arumí-Ribas & Romero-Fresco, 2008). According to Marsh (2006:3), this is done in order to make the workforce at Red Bee Media "as flexible and productive as possible, thus allowing Red Bee Media to attend to the BBC's 100% target by 2008".

But although respeaking is a topic of growing interest in the audiovisual domain, it has not yet attracted as much attention from the academic environment. Arumí-Ribas and Romero-Fresco confirm this, when they point

out that “[c]onsolidation of respeaking as a subtitling technique has not been reflected in the areas of teaching and research” (Arumí-Ribas & Romero-Fresco, 2008).

2.5.2.2 The Liberated Learning Project

Although research on respeaking as defined by Eugeni (in Arumí-Ribas & Romero-Fresco, 2008:107) has indeed been limited, interest from the academic world has been growing. For instance, an applied research project called the Liberated Learning Project (LLP) was started in 1998 at Saint Mary’s University, Canada in order to investigate speaker-independent speech recognition technology as a way to make speech available as written text in an academic context. The Liberated Learning Project studied two core questions:

1. “Can speech recognition (SR) technology successfully digitize lectures to display spoken words as text in university classrooms?”
2. “Can speech recognition technology be used successfully as an alternative to traditional classroom note-taking for persons with disabilities?” (Bain *et al.*, 2002:192).

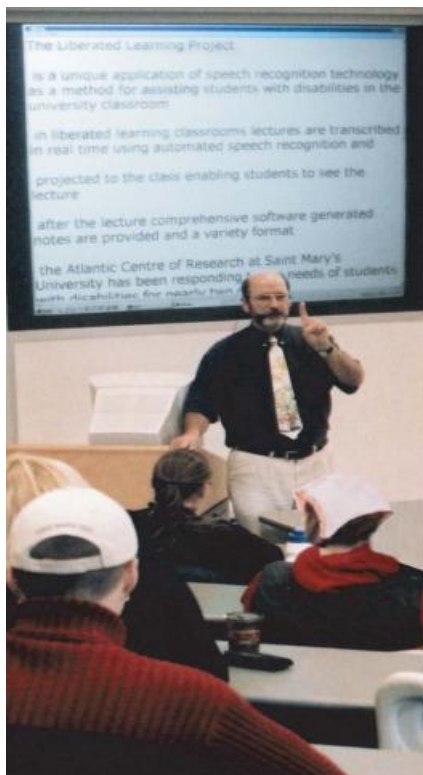
To clarify the difference between respeaking and speaker-independent speech recognition, it must be explained that the Liberated Learning Project used the commercial speech recognition software ViaScribe in order to find out whether the produced intralingual (full-page) captions were of a high enough quality to provide visual support to deaf and hard-of-hearing students (Bain *et al.*, 2005:592). However, in the context of LLP, no respeaker intervention was required. As such, the mode does not qualify as respeaking, but rather as speaker-independent speech recognition. Romero-Fresco (2011:54) points out that actual respeaking implies the use of SR software in a “speaker-dependent” way, i.e. when “a respeaker is needed as an intermediate step between the source text speaker and the software”.

Bain *et al.* (2002:193) state that “[t]he main objective of the Liberated Learning Project is to test applications of speech recognition in actual university

classrooms, develop and evaluate a model for using speech recognition in the university environment, and report on the impact of this technological intervention on students with disabilities, faculty and non-disabled students”.

Bain *et al.* (2005:593) describe a typical setup implemented at Saint Mary's University, in which speaker-independent SR is used in order to make lecture content accessible to deaf and hard-of-hearing students: "During class, instructors wear wireless microphones while delivering their lectures. ViaScribe automatically transcribes the digitized speech and displays it as text on a large screen for the entire class to read", in real time. The students can then simultaneously hear and read the words of the lecturer. However, in this case, the text does not appear on screen in the form of subtitles, but as a full-page transcription, the text moving up as it reaches the bottom of the page (see Figure 3).

Figure 3: Professor Gerry Cameron's lecture is transcribed and projected in real time at Saint Mary's University (2002).



The transcription and a recording of the lecture are made available to the students over the Internet in different formats, after the recognition errors that may have occurred during class have been corrected (correction does not take place during the lecture). The fact that the material was made available in different formats allowed students to choose a format that best suited their learning needs (Bain *et al.*, 2005:593).

The project was found to have the potential to revolutionise educational access for disabled students and, according to Bain *et al.* (2002:196), “has already resulted in dramatic increases in the knowledge and experience base with respect to potential educational applications for speech recognition”. In their comprehensive report on the results of the three-year study, Leitch and MacMillan (2001) discuss the students’ reactions to the mode. It is interesting to point out that, although the project’s aim was chiefly to facilitate access to lecture content for deaf and hard-of-hearing students, students with other disabilities (low vision, impaired mobility, ADD, learning disabilities) and non-disabled students were also involved, and reaped similar benefits to those reaped by the students with disabilities (Leitch & MacMillan, 2001:38). In the context of the LLP, Leitch and Macmillan (2001) carried out interviews with the different stakeholders, so that they could report on the way the LLP was perceived by the latter, in terms of its usefulness as a learning aid. The interviews yielded the following information:

On the whole, students with disabilities responded well to SR in the university classroom and acknowledged the benefits (as well as the challenges) of the LLP concept (Leitch & MacMillan, 2001:24). The responses of non-disabled students were very similar to those of students with disabilities. Leitch and MacMillan (2001:38) state that the students identified the same benefits, but also raised similar concerns. Moreover, their comments showed that they interacted with SR in much the same way as the students with disabilities. According to Leitch and MacMillan (2001:38), this shows that “the technology has a widespread applicability”. The positive outcomes of the Liberated Learning Project led to the creation of the Liberated Learning Consortium, a group of universities striving to take further the research on speaker-

independent SR as support for academic performance of students with disabilities, more specifically deaf and hard-of-hearing students, but also non-disabled students.

The fact that the introduction of SR in the university classroom has benefits for non-disabled students as well as students with disabilities prompted the current study to investigate the use of SR for non-disabled EAL students on the Vaal Triangle Campus of North-West University in South Africa. It is argued that EAL students are also in need of increased accessibility to study material presented in aural and written format. This view is echoed by Eugeni and Macke (2006), who state that respeaking can also be used to cater for other kinds of "special needs" than deafness. This could justifiably include language issues. Bain *et al.* (2005: 591) confirm this: "[...] text availability is often a preferred mode for non-deaf participants. Frequently the speakers, or the listeners, are non-native English speakers, and the additional text confirmation of what is being said aids in comprehension".

With regard to the information provided above on SR usage in the university classroom, it becomes clear that SR in general, and respeaking more specifically, have the potential to provide one solution to the issue of low levels of English academic literacy among EAL students in South Africa, by facilitating access to lecture content, and, related to the improved accessibility of information, improve comprehension and academic literacy.

In this section, the benefits of subtitles in general, and SLS more specifically, were discussed. It was concluded that subtitles and SLS have many benefits as a learning aid, both for foreign language students and second language students. A strong body of research specifically indicates that the double exposure of auditory and written content holds strong benefits in a teaching and learning context. This study therefore proposes to introduce SLS in the lecture room in order to help EAL students understand the lecture content better and to improve their levels of English academic literacy. Due to the very limited amount of information available on this topic, and therefore due to the difficulty in predicting the outcome of the study with precision, it may be

necessary to include further research cycles. The purpose of these additional cycles would be to refine the blueprint of the study in order to get closer to the anticipated outcome.

2.6 Conclusion

This chapter discussed a number of issues pertaining to the context in which this study was conceptualised. It highlighted the lack of English academic literacy among South African students and emphasised the link between inadequate academic literacy levels and poor academic performance as well as the link between studying through English as an additional language and poor academic performance. It proceeded to discuss the importance of reading and listening abilities in an academic context and argued that EAL students may experience difficulties in mastering these skills, more so than their first-language counterparts and that this therefore affects their comprehension of academic material. It therefore argued that an intervention aiming at providing EAL students with learning support is necessary. To fulfil this purpose, it was suggested that SLS be introduced in the classroom, both offline and via respeaking, due to the proven benefits of SLS in the EAL classroom and to the fact that speaker-independent SR was successfully used to facilitate access to academic material for deaf and hard-of-hearing students in the context of the Liberated Learning Project.

Chapter 3 The first research cycle

3.1 Introduction

Chapter 1 stated that the study consisted of three experiments or research cycles, following the principle of action research. The first research cycle draws on the notion that SLS via respeaking may be as beneficial to non-disabled students as they may be for disabled students (Bain *et al*, 2002:193; Leitch & McMillan, 2001:38) in terms of access to lecture content, in the sense that, according to Wald (2006:2), they have the potential to “assist and enable receptive communication”. As such, the first research cycle aims to determine whether SLS via respeaking have an impact on the academic literacy skills, and more specifically the receptive skills (reading and listening), and the subject-specific comprehension of EAL students. The hypothesis was that this potential impact would be due to students’ double exposure (aural and written) to the lecture content.

Firstly, this chapter explains how the experiment was set up. Secondly, it deals with the constraints of the mode itself and how these were addressed in order to ensure the quality of the SLS. Thirdly, it describes the way in which the relevant data was collected and analysed, in order to determine whether the outcomes corroborated the hypothesis that SLS help improve EAL students’ receptive AL abilities and, as a consequence, their comprehension of the lecture content. Fourthly, it reports on the data analysis and interprets the results. Finally, it concludes by discussing the constraints that led to the second research cycle.

3.2 The setup

3.2.1 Selection of the module

The module in which the research was conducted was selected based on the following requirements:

- It had to be a content module, as opposed to a language module, so that comprehension on the part of the students could be easily tested for a specific subject;
- The classes for both test and control groups had to be presented in English by the same lecturer, and be attended by EAL students; and
- The number of students taking the module had to be high enough in order to provide for several groups, so as to allow for a control group and a test group.

The subjects Accounting or Economics were thought to be ideal, because they are content modules, and because the number of students taking these modules is usually very high (860 approximately in 2009), thus requiring that the students be divided into groups. The groups could then choose the language in which they wish to be taught, which, in this case, was a choice between English and Afrikaans. After discussing the study with the relevant school directors, it was decided that the first-year second semester economics module, ECON 121, would be used. An additional motivation for selecting this module was the low throughput rate in this module in 2009. According to Management Information (10 January 2010), only 339 of the 721 students who registered for ECON121 in 2009 passed, a pass rate of 47%.

Students taking ECON 121 were divided into 3 groups, two of them being taught in English and one in Afrikaans.

3.2.2 Selection of the participants

At first, it was expected that English Group 1 and English Group 2 would form the sample population, Group 1 being the test group (i.e. the group that would be exposed to the live SLS) and Group 2 the control group (i.e. not exposed to the SLS). However, due to timetable constraints, this was not possible. Eventually, Group 2 was split randomly into two sub-groups of approximately 120 students each, sub-group 1 being the test group and sub-group 2 the control group. This was done using the website www.random.org, which contains a True Random Number Generator. Using this website, a list of

randomly-generated numbers between 1 and 237 (the number of students on the ECON 121 Group 2 class list) was created, and then copied and pasted next to the students' names and student numbers in the class list, which was available in Excel format, so that each student was attributed a number between 1 and 237. Then, each of these numbers was attributed a value of 1 or 2, still using a random method through www.random.org, which made it possible for students to be placed in either of the two sub-groups (sub-group 1 or sub-group 2).

An extra class was scheduled on the timetable to accommodate the additional group. The ECON 121 lecture for Group 2 was originally scheduled from 12:30 until 13:55 on a Friday afternoon. It was decided that this time slot would be allocated to the test group (sub-group 1), and that the control group (sub-group 2) would attend the lecture in the next period, i.e. from 14:00 until 15:25. These times were not ideal, however, as Friday afternoon lectures are typically not well attended by students, but due to timetable restrictions, they represented the only option at that stage. The class to be attended by the test group was scheduled in a venue large enough to accommodate the approximately 120 students, who were supposed to compose this group. It was also essential that the venue be equipped with multimedia facilities. Students in the control group, who were not to be exposed to the SLS, stayed in the venue that was originally attributed to them according to the timetable. In order to ensure comparability, the lectures the test and control groups attended had to be similar, and for this reason the same lecturer taught both classes on the same content, thus minimising variables.

Once the lecture schedule was organized, the students were informed of the fact that a research project was going to be carried out within their module. As required by the University's Ethics Committee, students were given the choice to take part in the study or not. Consent forms (see Addendum B) and information sheets (see Addendum C) were handed out to this effect. Only the data yielded by students having signed the consent form would then be taken into account in the study. Forty-six students agreed to take part in the study and thus signed the consent form. Twenty-four sets of data became available

in the test group (sub-group 1) and twenty-two in the control group (sub-group 2).

3.2.3 The technical setup

This cycle differed in some essential ways from the Liberated Learning Project (LLP) described in Chapter 2 and thus required a complex setup technically speaking so that these differences could be accommodated.

The first difference is that the cycle was based on speaker-dependent SR, i.e. a respeaker would be required to act as an intermediary between the software and the lecturer's utterances (Romero-Fresco, 2011:54). Respeakers therefore had to be selected and trained.

The second difference resides in the fact that the transcription was not verbatim, but rather aimed at being near-verbatim, which is the most common type of editing policy in the respeaking industry (Romero-Fresco, 2011:24). Romero-Fresco (2011:24) defines near-verbatim respeaking as respeaking that is "as verbatim as possible but often failing to convey 100% of the original soundtrack". However, the current study went even further away from verbatim respeaking since, apart from not repeating the lecturer's discourse word for word, the respeakers also edited it so as to leave out any element of the discourse that was not directly related to the academic content of ECON121. This made sense in the context of this study, as the purpose of the SLS was to provide learning support in terms of understanding the content of the lecture better. Any utterance not directly related to the academic content therefore did not need to be conveyed through the SLS. Besides, verbatim respeaking tends to be used mostly to subtitle programmes for the Deaf or hard of hearing, who consider any kind of editing of the original text as censorship (Romero-Fresco, 2011:114). The fact that the participants in this study are not deaf or hard of hearing reinforced the idea that near-verbatim SLS would be adequate.

An advantage of the near-verbatim method is that it delivers the subtitles at a slower reading rate (Romero-Fresco, 2011:24), which would be more accessible to the students. Indeed, according to Romero-Fresco (2011:109-110), individuals usually do not process written information as fast as they can process acoustic information. Moreover, the speed at which people read subtitles tends to be lower than the speed at which they read printed material because of competition between the subtitles and other input. Through the use of eye-tracking technology, D'Ydewalle (1987) reached the conclusion that 130 wpm is an adequate reading rate for viewers. But although this rate is still accepted as common practice in most subtitling countries, subtitling companies tend to set the appropriate reading rate at 160 wpm or even 180 wpm, based on the idea that the viewers' reading speed has been increasing due to regular exposure to subtitles (Romero-Fresco, 2011:110).

The third difference between this cycle and the LLP concerns the display of the text. In the context of the LLP, the text was displayed as a full page, which would scroll up as the lecturer spoke. In the current study, the text was displayed in the form of two-line SLS, appearing as consecutive units underneath the video of the lecturer (i.e. not scrolling). How this specific technical setup was achieved is described below. The training of the respeakers will first be discussed, followed by some considerations on the choice and training of the speech recognition software. Then, a precise description of the classroom setup will be provided. Finally, the respeaking methods and the constraints of the mode will be discussed.

3.2.3.1 Selection and training of the respeakers

Three people were identified as respeakers. Although none of them had actual experience in respeaking, they had acquired skills, through their respective training and professional experience, which would prove useful when faced with the task of respeaking lectures.

One member of the team of respeakers, the researcher, was a lecturer in European Languages and Language Practice, but possessed a postgraduate

degree in Language Practice including a subtitling component, which corresponds to what is expected of a respeaker in terms of qualifications, according to Romero-Fresco (2011:31). The other two members were selected due to their experience as simultaneous classroom interpreters on the Vaal Triangle Campus. Indeed, Arumí-Ribas and Romero-Fresco (2008:110) argue that one characteristic that respeaking and interpreting have in common is that they both involve simultaneous listening and speaking, and that “[s]imultaneous interpreters’ and respeakers’ verbal agility and speed must be activated immediately upon receiving the message”. Other common points include time constraints, real-time production, little or no margin for correction and the need for the respeaker/interpreter to control his/her voice while listening.

The first team member mentioned received three days of respeaking training prior to the start of the study, including training in the use of the SR software Dragon 10, which may seem little compared to the three-week to three-month training mentioned by Romero-Fresco (2011:32) as being the norm as far as training is concerned. The other two team members did not participate in the respeaking training, but were trained in the use of the speech recognition software used for respeaking.

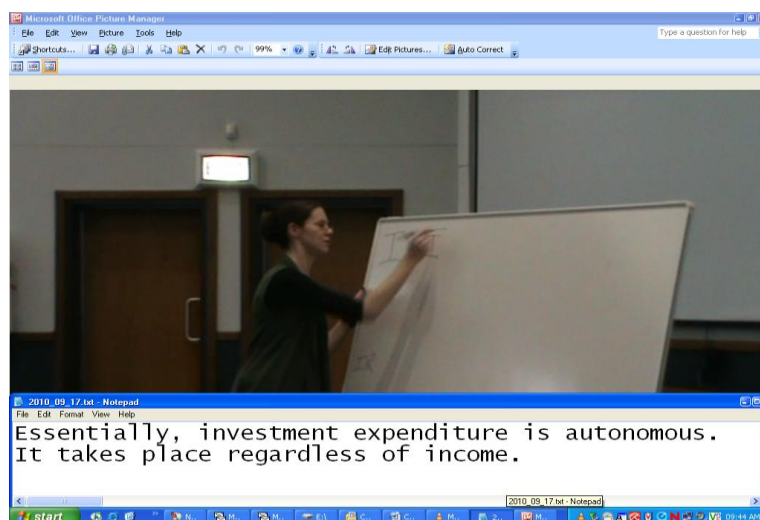
3.2.3.2 The classroom setup

The venue used to accommodate the test group was selected because it was equipped with multimedia facilities like a data projector and a computer, and because of its adjoining storeroom, in which the respeakers could sit and carry out their task to minimize auditory interference from sound sources in the classroom, and to allow respeakers to speak at a volume that would be more favourable for accurate recognition. At first, it was considered whether the respeakers could sit in class, but, in the absence of a booth, the likelihood that the respeaker's voice might interfere with the lecturer's discourse was too high.

Therefore, it was decided that the respeakers would sit in the storeroom, and would listen to the lecture by means of a cable linking the audio system in the venue to the respeakers' headset. The lecturer was required to wear a lapel microphone to ensure the quality of the sound. Upon hearing the lecturer's utterances, the respeakers would respeak each utterance, which would then be transcribed as text in the Dragon Pad feature of Dragon 10, or in Notepad. The size of the Dragon Pad or Notepad window was adjusted so that it would fit the width of the laptop's screen and so that it would allow two lines of text to appear at any given time. Romero-Fresco (2011:105) actually recommends that respeakers should attempt to keep their utterances within two lines, whenever possible, as is the case in ordinary subtitling.

The visual input was obtained as follows: the lecturer was filmed while presenting the class, by an assistant sitting in the first row of seats. The image was then fed live into the respeakers' laptop, which was itself connected to the data projector. As a result, the visual input was exactly the same for the respeakers and the students. Both would see the video of the lecturer, the Dragon Pad or Notepad window and the text appearing in the latter, as the respeakers repeated the lecturer's words (see Figure 4).

Figure 4: A screenshot of the video and the SLS via respeaking, as seen by the participants in the study.



Throughout the intervention, the respeakers kept a log of the sessions (see Addendum D), in order to record any technical issues that may have affected the quality of the subtitles. Classroom observations, which aimed at determining, on a general basis, whether the students actually looked at the subtitles, were also recorded in the log.

The next section deals with the constraints of the mode and how they were dealt with in order to ensure that the SLS produced via respeaking would be of optimal quality.

3.3 The constraints of the mode

3.3.1 The SR software

A number of Speech Recognition (SR) software programs are available on the market, such as Dragon Naturally Speaking (available in 4 different versions: Standard, Preferred, Professional and MacSpeech Dictate, for Macintosh), Viascribe, ViaVoice and Windows Speech Recognition, for the purpose of converting speech to text. Dragon 10 was selected not only because it was used in the context of the aforementioned respeaking training, but also because this specific edition of the software was said to be “20% more accurate than previous editions, regularly achieving 99% in dictation, and more than 50% faster displaying the dictated words on the screen” (Romero-Fresco, 2011:67). But above all, it was selected due to the fact that it does not require intensive training, because it displays remarkable ‘out-of-the-box’ accuracy.

This is not to say that no training is required. Dragon 10 must be trained so that its recognition of the individual respeakers’ voices is optimized. This was done by first using Dragon 10’s integrated training texts, and second, by using audio recordings of two ECON 111 lectures, which enabled the respeakers to get used to the topic of Economics and to the lecturer's way of speaking, as this lecturer was also going to present ECON 121. Subsequently, the respeakers, in consultation with the lecturer, would prepare for each class

using the course book. This preparation would allow the respeakers not only to familiarize themselves in advance with the content of the lecture, but also to train some of the subject-specific terminology which they thought Dragon may have difficulty recognising.

3.3.2 The accuracy rate

3.3.2.1 Training Dragon Naturally Speaking 10

Dragon 10 had to be trained thoroughly so as to minimise inaccuracies. Respeaking in the classroom means that, although the lecturer cannot be expected to follow a script, the material on which the lecture is based is readily available to the respeaker, allowing the latter to familiarise him/herself with the contents and the subject-specific terminology in advance, and to train the speech recognition software accordingly. Situations that may arise in live broadcast (e.g. the speaker improvises or changes the subject altogether) are therefore limited. Lambourne (2006:3) states that with adequate training, the accuracy of a speech recognition system can reach 95-98%. Bain *et al.* (2005: 591) confirm that “[s]tudies suggest that trained speakers can achieve accuracy levels that make this a viable tool for live subtitling”. More specifically, the accuracy rate that can be expected from speaker-independent SR in the classroom was tested by Ross Stuckless, a project consultant for the LLP (in Leitch & McMillan, 2011: 79-86). Using a method he developed, called the NTID Test of ASR Readability, and based on the voice/text files of three lectures, each presented in the context of a different course, he established that the accuracy rate for these three lectures was 88.1% (Leitch & McMillan, 2001:85).

During the semester preceding the start of the study, the ECON lecturer was requested to carry a small mp3 audio recorder on her during lectures. The audio recordings were then used by the respeakers in order to prepare themselves and train Dragon 10. Dragon 10 also has a feature which allows the user to import written text in an electronic format into the system to improve the recognition. The ECON 121 study guides, which were available

electronically, were therefore added to the software, thus making all the subject-specific terminology available in the Dragon 10 database. Difficult or unusual words could then be trained individually, if Dragon showed difficulties in recognising them during training based on the audio recordings of lectures.

The respeakers were also provided with a copy of the ECON 121 course book prior to the start of the study, so that they could familiarise themselves further with the content. In addition, they were given information regarding which specific chapter(s) would be covered during each class, so that they could prepare said chapter(s) in advance. However, despite extensive training and preparation, Dragon could never be 100% accurate, which means that errors appeared at every respeaking session and had to be corrected. Romero-Fresco (2011:23-24) refers to three main options in terms of correction: no correction, self-correction and parallel correction, self-correction being the most common method and the method that was adopted in the context of this study. The respeakers therefore corrected their mistakes live, after the errors were displayed on screen. As a result, students attending the lecture could see the corrections being made within the SLS. Not correcting errors was not an option, due to the fact that highly accurate SLS are needed in an educational context. Parallel correction was technically not possible to achieve, because this method consists in correcting the SLS before they appear on screen (Romero-Fresco, 2010:24), which requires broadcasting equipment that was not available.

Having access to the material on which the lectures are based also helped in terms of the lack of synchrony, as it reduced the unpredictability rate, which in itself may be a cause for further delay in the appearance of the SLS. However, correction of the SLS may increase the delay, depending on how much time and effort need to be dedicated to corrections.

Although Dragon 10, as mentioned earlier, has a remarkable 'out-of-the-box' accuracy, and can reach accuracy rates of up to 99% with the appropriate training, an accuracy rate of 100% is still beyond its capabilities, and those of any other SR software. This means that no SLS produced via respeaking will

be without errors due to the constraint of the technology that cannot yet deal 100% with the complexity of natural language. However, this does not make Dragon inadequate in the context of this study. Indeed, according to Wagner (2005:4), a minimum accuracy rate of 96% is required for the information transfer to be adequate. However, this minimum accuracy rate may vary in the industry, depending on the company. The BBC, for instance, expect Red Bee Media, their provider of subtitles via respeaking, to achieve a minimum of 97%. These are high percentages, but are not beyond the reach of Dragon 10.

3.3.2.2 The respeaking method

In order to ensure that the SLS produced via respeaking were as accurate as possible, the following steps were taken: first of all, a manageable method of transcription had to be agreed upon. According to Romero-Fresco (2011:24), the transcription of speech to text via SR software can be either verbatim (i.e. conveying 100% of the original soundtrack) or near-verbatim (i.e. as faithful to the original spoken text as possible, while often failing to convey 100% of the latter). Because verbatim transcription might have made it difficult to attain optimum accuracy, especially in the context of a lecture, it was decided that a near-verbatim method of transcription would be applied in the context of this study. A mediated kind of transcription was indeed likely to be more manageable and to place less strain on the respeakers.

The nature of the speech used in lectures was an important factor in the decision: Bain *et al.* (2002:194) state that “[...] most lectures are characterized by extemporaneously generated speech. The dynamism present in this environment inevitably generates false starts, disfluencies, hesitations, ungrammatical constructs, etc.” This type of speech can be very difficult to follow for the respeakers, and differs so widely from the requirements of written speech that a verbatim transcription would most certainly make the SLS not only appear on screen for too short a time, but also make them confusing, or possibly incomprehensible for the students. More specifically, it was agreed that any utterance not directly related to the academic content of

the lecture or pertaining to extemporaneous speech would not be respoken, for instance:

- Repetitions (if the lecturer makes the same statement twice, or insists on a specific point by repeating the same utterance over and over)
- Hesitations (e.g. err... ; uhm...)
- Jokes
- Comments made to students arriving late or whose cellular phone rang in class
- Instructions regarding homework or evaluations
- Students' utterances: Although the interventions of students during the class may have represented valuable learning opportunities, it was decided not to include them, because these interventions were very rarely audible for the respeakers. Indeed, it was not possible to provide the students with a microphone. At first, it had been arranged with the lecturer that she would, as much as possible, repeat students' questions or answers in order to allow the respeakers to repeat them, but this turned out to be too much of a constraint for the lecturer.

Caimi (2006:92) and Guillory (1998:104) highlight the importance of transferring the speech in a more concise way and of transferring only the core concepts which are essential to the comprehension of the speech. Besides, since the aim is not verbatim transcription, but rather learning support, the speed of the SLS will be significantly lower than that of speech. This will allow students to read the SLS and to have access to the non-verbal context of the utterances in class at the same time. Neves (2004:135) supports this view: "[...]in audiovisual translation fidelity is particularly due to an audience that [...] is in need of communication effectiveness, rather than in search of artistic effect [...] or of exact equivalence".

Thus, it was anticipated that the SLS would be readily understandable, and would be made more concise so that they could remain on screen long enough for the students to be able to read them. At this point, it is important to mention again that, in the context of this study, the aim of the live SLS via

respeaking was not to replace the lecture, but to provide the participants with learning support. Indeed, unlike deaf or hard-of-hearing students, the participants can access the information presented in class (despite a disadvantage due to their EAL status) and as such do not require that the class be transcribed verbatim. This respeaking method was also thought to help with some of the constraints that are inherent to respeaking: accuracy, lack of synchrony and the students' reading speed. The ways in which these constraints were dealt with are described below.

However, from the first respeaking session, it became clear that due to technical constraints and a need for further training in respeaking, even a near-verbatim transcription would be problematic to achieve. Indeed, from the aligned file corresponding to the first lecture (see Addendum E), it can be seen that the respoken transcript substantially reduced the original text. As a result, a near-verbatim transcription was not achieved. Therefore, it was decided at that stage that a different kind of approach should be adopted: instead of a near-verbatim respeaking method, a method focusing on conveying the core concepts of the lecture was to be used.

3.3.2.3 The lack of synchrony

A lack of synchrony, or delay, means that there is a discrepancy between the utterance of the lecturer and the appearance of the text on screen. Arumí-Ribas and Romero-Fresco (2008:109) state that a 3 to 4 second delay is to be expected when it comes to respeaking. However, in a recent publication, Romero-Fresco (2011) provides a number of examples which show that the delay may actually vary greatly depending on the SR software used, the type of audiovisual material being respoken and the number of corrections which is carried out. For instance, Romero-Fresco (2011:24) mentions delays of up to 15 seconds in the case of French broadcasters, due to the fact that the latter privilege the correctness of the SLS as opposed to the speed at which they appear on screen. However, on average, SLS produced with Dragon have a delay of 4 to 7 seconds (Romero-Fresco, 2011:65).

In the context of this study, keeping the delay to a minimum was a priority, because SLS appearing too late are confusing for the viewers and may actually distract them from the audiovisual material altogether (Díaz Cintas & Remael, 2007:90). It may also undermine the benefits of the double exposure to the learning material, because the students will be hearing one thing and reading the transcription for something the lecturer said previously. Although care was taken to reduce the delay to a minimum – (the methods used to achieve this are described in detail in the next paragraph), the live nature of the intervention and the fact that it was not possible to make a recording of the subtitled video, made it problematic to evaluate what the delay may have been in the context of the study.

The goal of keeping the delay to a minimum was achieved in the following way: First, the respeakers prepared thoroughly for the classes, using the course book, study guides and any other material provided by the lecturer, in order to minimise any hesitation on their part, which would then lead to a longer delay. Secondly, the toggle Accuracy vs. Delay available in Dragon was adjusted so as to make the best possible compromise between these two essential aspects of respeaking, i.e. half-way between the two. Thirdly, the respeakers were trained to make regular short pauses after each sentence or semantic unit, to allow Dragon to display the text. Indeed, Dragon 10 only displays the transcription of the speech when the respeaker pauses. Romero-Fresco therefore recommends that users of Dragon should try and find “a good speech-to-pause rhythm” (Romero-Fresco, 2011:104). Finally, it was decided to bring the spoken language closer to the norms of written language, and to focus on central concepts, by leaving out utterances typical of spoken language, such as hesitations (e.g. ‘uhm’, ‘err’), false starts and unnecessary repetitions. However, syntactically incorrect sentences were not left out, but were corrected. In other words, the SLS were highly mediated and not a verbatim transcription of the words of the lecturer, as mentioned previously in section 3.4.4, which would help minimise the delay.

3.3.2.4 The reading speed of the students

In order for the SLS to be effective, the subtitle rate should be such that the students are able to read them. This means that the SLS should remain on screen long enough for the students to have a chance to read them. In the words of De Linde and Kay (1999:74), “the efficacy of intralingual subtitling depends on the reading capacity of its viewers”. In the case of SR, however, it is not as straightforward to control the subtitle rate as it may be when producing off-line subtitles. Verbatim transcription of spoken text implies that if the speaker has a high speech rate, the respeaker has no choice but to more or less match this rate in order to keep up with the lecturer’s utterances. As a result, the subtitles may come on and go off the screen too fast for the audience to be able to read them.

This represented a concern in the context of this study, as it must be noted that, at the start of the study, the average reading speed of the students in the test group was 228 wpm, with an average comprehension rate of 69%⁶, which is lower than the academic requirement of NWU. Indeed, the latter states that students should be able to read at a rate of 420 wpm, with an 80% comprehension rate. However, as stated above, the same reading speed cannot be applied to the reading of subtitles. Besides, through the use of the respeaking method described in section 3.5.1.2, the speed of the SLS was significantly lower than that of speech, thus allowing students to read the SLS and to have access to the non-verbal context of the utterances in class at the same time.

The constraints described above – the accuracy rate of the SLS, the lack of synchrony between the lecturer's utterances and the SLS, as well as the reading speed of the students – may affect the anticipated outcome of the study.

⁶ This information was collected through the Academic Development and Support department on NWU’s Vaal Triangle Campus. Academic Development and Support requires all students to undergo a reading test to evaluate their reading ability, using either of the two following tools: Read-On or Academix. No data was available for 8 of the participants.

3.4 Data collection and interpretation methods

3.4.1 Collecting the data

Since this study investigates the potential benefits of SLS via respeaking on the comprehension and academic literacy levels of students, the following data was collected:

- The participants' module marks for ECON 111 and ECON 121.
- The participants' module marks for AGLE 111 and AGLE 121. The original plan involved the use of the marks the students obtained for a TALL pre-test and TALL post-test. However, too few students wrote the post-test for the data to yield any reliable information as to the impact of SLS on academic literacy.
- The participants' module marks for all their other registered modules, even those that were not involved in the study.

Only the data yielded by the participants who signed the consent form was taken into account. This data was used as described in the following sections.

3.4.1.1 The ECON 111 and ECON 121 module marks

The ECON 111 and ECON 121 module marks were compared in order to establish whether an improvement in terms of comprehension in the subject Economics had occurred in the test group between the first and the second semester, as was anticipated. Should the test group show a statistically significantly higher improvement in terms of their performance in ECON121 from ECON111 than the control group, it may support the hypothesis that the respoken subtitles improved subject-specific comprehension.

Obviously, this data could not be used as bona fide improvement since ECON 111 and 121 cover different work at different academic levels (first versus second semester). Nevertheless, since this was the same for both test and control group, a statistically significant difference could indicate an effect obtained by SLS.

3.4.1.2 The AGLE 111 and AGLE 121 module marks

The AGLE 111 and AGLE 121 module marks were compared in order to establish whether a statistically significant improvement could be observed in terms of academic literacy for the test group between the first and the second semester when compared to the improvement of the control group. However, not all of the participants had marks for AGLE 111, because this module must only be completed by students whose TALL results do not meet the university's requirements, whereas AGLE 121 is compulsory for all students. As a result, in order to get as clear a picture as possible of the impact of SLS via respeaking on academic literacy, the AGLE 111 and 121 marks were first compared by including all participants and secondly by only taking into account the participants who had attended both modules.

Since AGLE111 and 121 cover different work, the same constraint applies as in the case of ECON111 and 121 above, but similarly, any statistically significant difference could be indicative of the impact of SLS.

3.4.1.3 The other module marks

The reason why the module marks for modules other than AGLE and ECON were also collected was to establish whether the test group had performed better than the control group in other modules and not only in AGLE 121 and/or ECON 121. If the exposure to SLS had indeed had a positive impact on the academic literacy levels of the test group, the improvement in academic literacy could be expected to have transferred to other subjects. If, however, the test group had only performed better in ECON 121, and not in AGLE or the other subjects they registered for, it could be concluded that the impact of SLS concerns subject-specific comprehension as opposed to general comprehension.

Before they could be included in the statistical analysis process, the following marks were used to calculate the following averages, together with the AGLE and ECON marks: the year average (AVG year), the year average without

AGLE and ECON (AVG year without AGLE and ECON), the averages for the first and second semesters (AVG Sem1 and AVG Sem2), and the averages for the first and second semesters without AGLE and ECON (AVG Sem1 without AGLE and ECON and AVG Sem2 without AGLE and ECON).

3.4.2 Methods of interpretation of the data

3.4.2.1 The module marks

The results for the different modules were analysed in order to find out whether the students in the test group showed a significant improvement in comprehension and academic literacy compared to the students in the control group, between the first and the second semester.

After collection, the data was cleaned up as follows: Where students did not get examination admission, their participation mark was used as the average module mark. Where both a first and second opportunity examination mark was available, only the second opportunity mark was taken into account. All the data was deleted where a module was recognised but no examination was written.

The data was deemed to lend itself to an interpretation using a *t*-test, due to the fact that the planned statistical analysis met two of the criteria calling for the use of *t*-tests, as described by Pietersen and Maree (2010:225):

- When two independent groups need to be compared based on their average score on a quantitative variable.
- When the average scores on two quantitative variables need to be compared in a single sample.

The first criterion applies because the module marks obtained by the test group and the control group, which are independent from each other, needed to be compared, so as to determine whether the test group showed a significant improvement in terms of comprehension. More specifically, a *t*-test

for independent samples was required. The second criterion also applies because the module marks obtained by each group in the first and the second semesters needed to be compared, in the test and the control group separately, in order to determine whether a significant improvement could be noted, within each group, in terms of comprehension and/or academic literacy. In this case, a *t*-test for dependent samples could be used.

However, before the *t*-test could be applied, the data was subjected to a normality test, in order to determine with added precision whether the sample came from “a normally distributed population of observations” (Hill & Lewicki, 2006:18). The Shapiro-Wilk *W* test was used to test normality, using the statistical analysis software Statistica version 10 (Statsoft, 2011). The Shapiro-Wilk *W* test has recently become the preferred test of normality because of its good power properties compared to a variety of alternative tests (Hill & Lewicki, 2006:640). The test revealed that the data for ECON 111 was not normally distributed due to a lack of variance in the middle. This was confirmed by the fact that the *W* statistic for this module was significant. However, it was decided that it was not necessary to apply a non-parametric alternative for the *t*-tests, as would normally have been the case (Hill and Lewicki, 2006:11), since only the data for ECON 111 was found to be abnormally distributed.

3.4.2.2 Evaluating the accuracy rate of the SLS

While discussing the constraints of the respeaking mode and the ways in which to deal with these constraints, the previous section stressed the importance of accuracy as far as SLS via respeaking as a learning aid is concerned. The accuracy and quality of the SLS may indeed have a significant impact on the comprehension of the students and must therefore be taken into consideration when discussing the outcome of the study.

The respeaking industry makes use of a variety of models to evaluate the accuracy of respokey subtitles. These methods yield an accuracy rate in the form of a percentage value, which can be compared to the 96% minimum accuracy rate recommended by Wagner (2005:4). Romero-Fresco (2011:144-

148) refers to three different calculation models:

- The WER methods, which are used by the US National Institute of Standards and Technology and express the quality of recognition either in terms of word correctness or word accuracy.
- The CRIM method, which is used by the Centre de Recherche Informatique de Montréal. It is based on the WER method, but focuses on word accuracy and involves the intervention of a human operator in order to decide whether the deletions have caused a significant loss of information.
- The NERD model, which draws on the principles of both the WER and CRIM methods, while providing a more holistic approach to determining the accuracy rate. Indeed, it seeks to meet the basic requirements suggested by Romero-Fresco (2011:144 – see Addendum F).

However, none of these methods is suitable in the context of this study, due to the fact that they aim at evaluating verbatim or near-verbatim SLS. They are thus not suited to the evaluation of SLS produced via a respeaking method focusing on core concepts and as a result allowing for extensive editing of the content.

In this study, the respoken transcripts were compared to an edited transcript of the lecture, from which utterances that are not directly related to the academic content or that are characteristic of extemporaneous speech were removed (as discussed in section 3.4.1.2). At that stage, it could be seen that the respoken transcript had considerably reduced the original text in terms of the number of words. The SLS produced during the first lecture (1197 words), for instance, represented only approximately 21.7% of the near-verbatim transcript (5504 words). In the last lecture, the respoken transcript (1484 words) reduced the near-verbatim transcript (8316 words) by approximately 82.2%. The same occurred in the remaining three lectures.

However, the idea of evaluating subtitles' accuracy in terms of a near-verbatim transcription had been abandoned after the first lecture. The focus was then on determining whether the respoken transcript, as reduced as it may be, succeeded in conveying the core concepts of the lectures. The ECON 121 lecturer was therefore asked to review the aligned files and to comment on whether the SLS indeed conveyed the core concepts presented during the lectures.

3.4.2.3 The accuracy of the SLS

As explained above, none of the models currently used in the respeaking industry in order to calculate the accuracy of SLS was suitable in the context of this study. The ECON 121 lecturer was therefore requested to evaluate the SLS in terms of how successfully they conveyed the core concepts presented in the lecture. The involvement of the lecturer, as a subject specialist, also served to minimise the subjectivity linked to the identification of core concepts. The lecturer added comments and corrections to the aligned files (see Addendum E for the file corresponding to the first lecture, as an example) and provided a short report in which she described her general impression of the SLS in terms of their effectiveness in conveying core concepts.

“The subtitle software used is very impressive. I was initially hesitant as to the possible disturbance the project would cause in my class but I most certainly reviewed my initial impression once the project was running. The subtitles provided my students with the opportunity to catch any material that they missed during the lecture. The material delivered by the subtitles was in line with that delivered in the lecture. There is, of course, room for improvement and I would suggest that future projects include greater participation of the lecturer concerned to ensure that the re-speakers have more content-specific knowledge or clarity with regard to the core concepts delivered during a particular lecture. Overall the subtitles are “Good”. However, I believe that frequent projects of this nature would create the greatest difference to the module involved and the quality of subtitles delivered by the re-speakers.”

As a subject specialist, the ECON 121 lecturer rated the SLS as “Good”. It can therefore be concluded that despite the extensive reduction in the number of words compared to the original text, the SLS succeeded in conveying the core concepts relevant to each lecture.

3.5 Presentation and interpretation of the results

The purpose of this section of Chapter 3 is to achieve the main aim of the study, which is to show whether or not exposure to SLS in the classroom helps improve the receptive AL abilities (listening and reading ability) and the subject-specific comprehension of EAL students.

This section will therefore attempt to answer the following questions from the aims described in Chapter 1:

- Does exposure to SLS in the classroom improve receptive academic literacy abilities? As AGLE 111 and AGLE 121 cannot be said to be comparable – as a second semester subject, AGLE 121 is supposed to be more challenging than AGLE 111 and covers different work--, the potential impact of SLS on academic literacy was determined by comparing the difference in performance between the control group and the test group in AGLE 111 and AGLE 121 respectively. Since this research cycle was carried out in the second semester, the test group was not expected to perform better than the control group on AGLE 111. However, a greater difference in performance in AGLE 121, favouring the test group, could be expected. The results for both AGLE 111 and 121 could be considered as a good indicator of students’ receptive academic literacy abilities since, apart from a focus on productive AL abilities, these courses award a very strong focus to receptive AL ability and are based on the same set of outcomes that is the blueprint for the TALL (see Weideman, 2003:xi). Although the TALL could be said to measure mainly receptive academic literacy ability, it is important to note that all the functional abilities measured by the test are necessary for students to be able to produce appropriate academic texts.

- Do SLS have a positive impact on comprehension in the specific subject in the context where they were employed? Such an impact would be evidenced in an improvement in performance on the part of the test group. This was determined by comparing the difference in performance between the control group and the test group in ECON 111 and ECON 121 respectively. Similar to AGLE, no improvement was expected in the context of ECON 111, since the intervention took place in the second semester, that is to say in the context of ECON 121. Although the ECON 111 and ECON 121 marks are not directly related, as they reflect the degree to which the participants achieved the outcomes of these two different courses, it may be possible to make deductions concerning the impact of SLS if the test group were to show a statistically significant improvement in performance when compared to the performance of the control group. In other words, the mark for ECON 111 provides a kind of base line against which to measure the performance in ECON 121. This also applied to AGLE 111 and AGLE 121.

The first and second semester marks obtained by the students for all the other modules they were registered for were also taken into account. The reason for this was to find out whether the potential impact of SLS on academic literacy did not only concern ECON and AGLE, but transferred to other subjects as well. Here, the assumption would be that, if the test group performed better in AGLE 121 and overall in the second semester, then the intervention indeed benefited them.

3.5.1 The ECON 111/121 module marks

The ECON 111 and ECON 121 module marks were first analysed using the *t*-test for independent samples, in order to compare the performance of the control and test groups in terms of ECON 111 and ECON 121 (see Table 2). The results show that the control and test groups performed at a similar level in the subject Economics in the first semester (ECON 111). Indeed the *p*-value is greater than .05, which is the value considered as "borderline

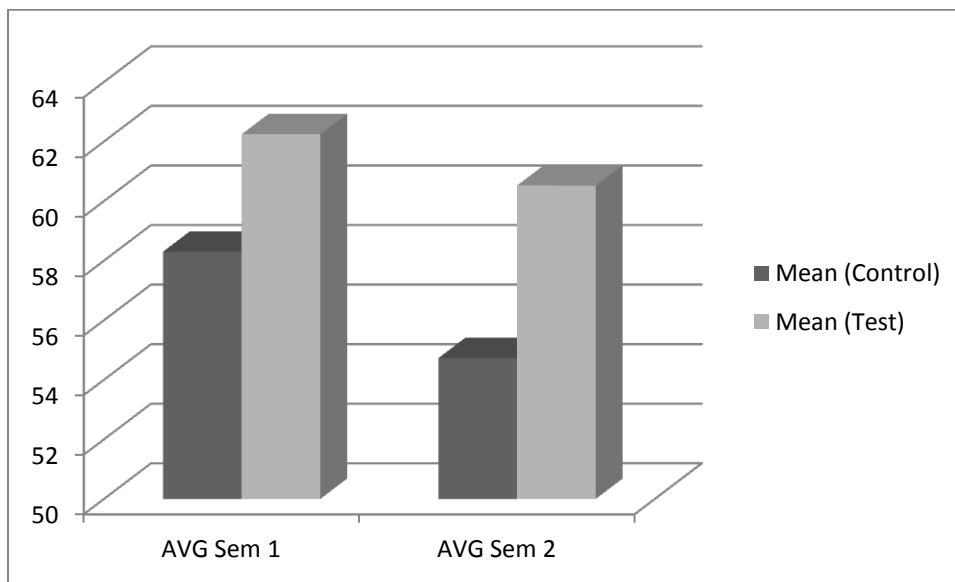
statistically significant" (Hill & Lewicki, 2006:6). This indicates that there is no significant difference between the means. The same can be noted in the second semester (ECON 121).

Table 2: T-test for independent samples on ECON 111 and ECON 121 (test group vs. control group)

Variable	T-tests; Grouping: Group (Fanny data with groups) Group 1: Control Group 2: Test										
	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
ECON111	54.59091	58.37500	-1.33383	44	0.189125	22	24	9.97454	9.26805	1.158267	0.728549
ECON121	46.59091	52.20833	-1.58832	44	0.119376	22	24	12.68167	11.30594	1.258170	0.590018

However, even though the difference between the test and control groups is not significant in either ECON 111 or ECON 121, the control group went from an average pass mark to an average fail mark, whereas the test group passed in both semesters. This would seem to suggest a positive trend. Graph 1 below illustrates this, by comparing the mean scores of the test and control groups for both ECON 111 and ECON 121.

Graph 1: Mean scores for ECON 111 and ECON 121 (test group vs. control group)



	ECON 111	ECON 121
Mean (Control)	54.59091	46.59091
Mean (Test)	58.375	52.20833

To further test this trend, the ECON 111 and ECON 121 module marks were analysed using the *t*-test for dependent samples, in order to determine whether a statistically significant improvement in terms of comprehension had taken place in the test group, compared to the control group. The results displayed in Tables 3 and 4 below show that the performance of both the control and the test groups in the second semester was significantly poorer than their performance in the first semester. Indeed, the performance of the control group was 8% poorer and that of the test group approximately 6.2% poorer.

Table 3: T-test for dependent samples on ECON 111 and ECON 121 (control group)

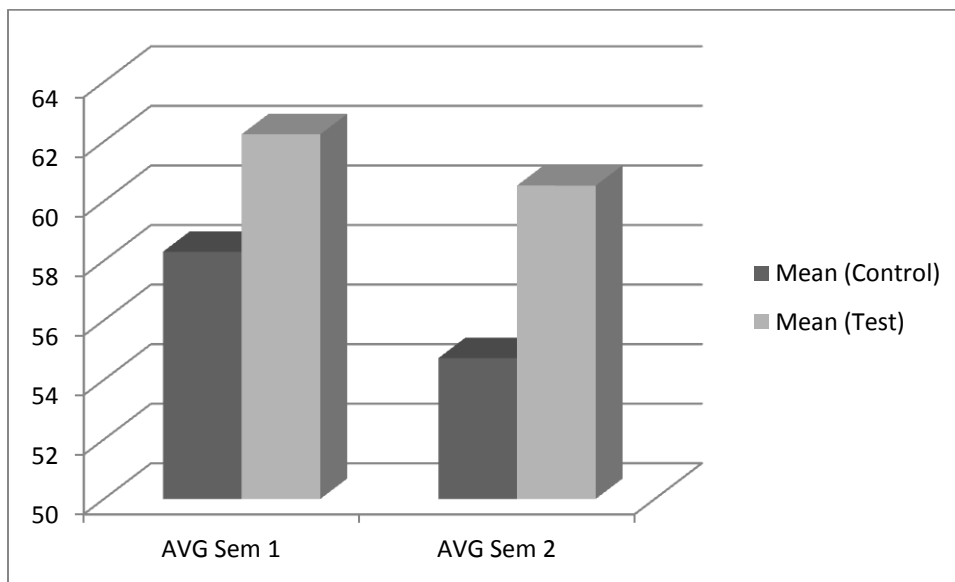
Group=Control T-test for Dependent Samples (Fanny data with groups) Marked differences are significant at $p < .05000$										
Variable	Mean	Std.Dv.	N	Diff.	Std.Dv. (Diff.)	t	df	p	Confidence (-95.000%)	Confidence (+95.000%)
ECON111	54.59091	9.97454								
ECON121	46.59091	12.68167	22	8.000000	9.586697	3.914104	21	0.000798	3.749497	12.25050

Table 4: T-test for dependent samples on ECON 111 and ECON 121 (test group)

Group=Test T-test for Dependent Samples (Fanny data with groups) Marked differences are significant at $p < .05000$										
	Mean	Std.Dv.	N	Diff.	Std.Dv. (Diff.)	t	df	p	Confidence (-95.000%)	Confidence (+95.000%)
ECON111	58.37500	9.26805								
ECON121	52.20833	11.30594	24	6.166667	5.865645	5.150392	23	0.000032	3.689822	8.643512

Nevertheless, whereas the control group went from a pass to a fail on average, the test group passed in both semesters, thus yielding a better throughput rate, as shown in Graph 2 below. This deserves to be highlighted, as there is a significant difference between a pass and a fail when it comes to academic performance, to the effect that the difference between 48 and 52 is more important than the difference between 52 and 56, for example.

Graph 2: Mean scores for ECON 111 and ECON 121 (test group vs. control group)



	ECON 111	ECON 121
Throughput rate (Control)	86.3	50
Throughput rate (Test)	95.8	58.3

3.5.2 The AGLE 111/121 results

Similar to the ECON 111 and ECON 121 results, the AGLE 111 and AGLE 121 results were analysed using the *t*-test for independent samples, in order to compare the performance of both the control and the test group in terms of academic literacy. First, a *t*-test was run based on the results of all participants in the study (see Table 5). The data contained in Table 5 shows that the test and the control groups were very similar in terms of performance in the first semester,

with means of 57.0833 and 58.72727 respectively. The p -value corresponding to the data analysis for AGLE 111 indicates that the difference in means between the two groups is not significant. In the second semester, on the other hand, the means show that the control group's performance was poorer than in the first semester, whereas the test group's performance was better. It is worth noting here that, although the corresponding p -value ($p = 0.076713$) does not indicate significance, it is actually closer to significance ($p < .05$) than the p -value corresponding to AGLE 111.

Table 5: T-test for independent samples on AGLE 111 and AGLE 121(including all participants)

Variable	T-tests; Grouping: Group (Casewise deletion of missing data) (Data_AGLE) Group 1: Control Group 2: Test										
	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
AGLE111	57.0833	58.72727	-0.52425	21	0.605592	12	11	8.17378	6.70956	1.484081	0.541794
AGLE121	52.5000	61.37500	-1.81472	42	0.076713	20	24	19.11048	13.21992	2.089708	0.093738

However, the reason for this difference in performance between the two groups may only be due to the fact that the number of participants who completed AGLE 121 (20 in the control group and 24 in the test group) was higher than the number of participants who completed AGLE 111 (12 in the control group and 11 in the test group). Indeed, unlike AGLE 121, AGLE 111 is not a compulsory subject for all students. This explains why more students attended AGLE 121. Therefore, another *t*-test was run, including only the marks of participants who had attended both modules. This was done by deleting the data casewise, thus excluding the participants who did not have a mark for both semesters (see Table 6).

Table 6: T-test for independent samples on AGLE111 and AGLE 121 (including only participants having attended both modules)

Variable	T-tests; Grouping: Group (Casewise deletion of missing data) (Data_AGLE)										
	Group 1: Control					Group 2: Test					
	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
AGLE111	57.0833	58.72727	-0.52425	21	0.605592	12	11	8.17378	6.70956	1.484081	0.541794
AGLE121	45.6667	53.72727	-1.46135	21	0.158723	12	11	16.45563	8.295672	3.934830	0.039396

The results of this *t*-test show that including only the marks of the students who attended both modules into the statistical analysis does not change the fact that no significant difference in performance can be noted between the two groups. However, what should be mentioned is that the mean corresponding to the control group changed from a pass mark of 52.5% to a fail mark of approximately 45.6%. On the other hand, the test group's mean remained a pass mark despite the fact that it also decreased.

A *t*-test for dependent samples (see Tables 7 and 8) carried out using the data corresponding to the control group and the test group separately confirms that the performance of both groups was poorer in the second semester. The means indicate that the control group's average decreased from approximately 57% to approximately 46%, while the test group's average decreased from approximately 59% to approximately 54%. However, the *t*-test for dependent samples also shows that the decrease in performance on the part of the control group is to be considered as statistically significant, as $p < .05$ (see Table 7), whereas the decrease in performance on the part of the test group is not, because $p > .05$ (see Table 8).

Table 7: T-test for dependent samples on AGLE 111 and AGLE 121 (control group)

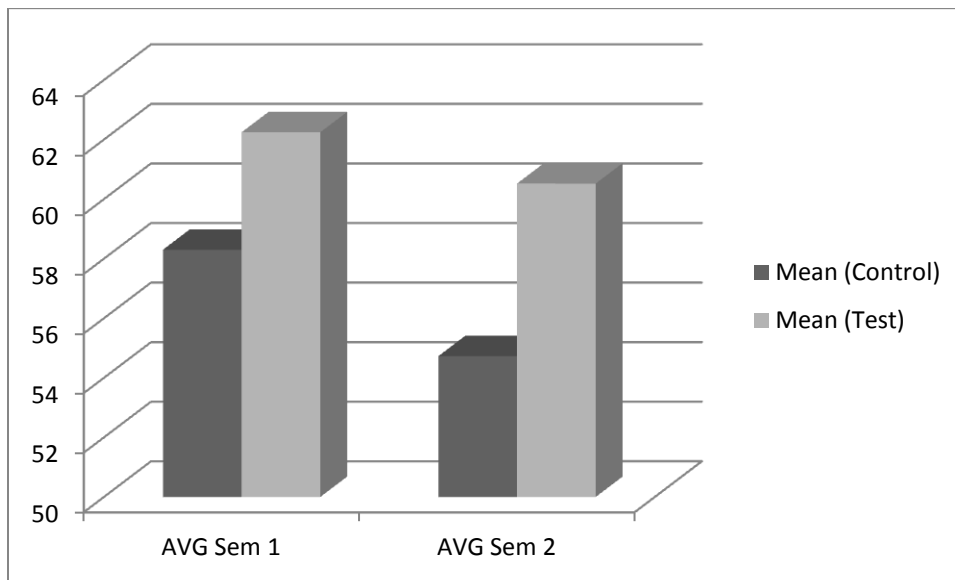
Group=Control T-test for Dependent Samples (Fanny data with groups) Marked differences are significant at $p < .05000$										
Variable	Mean	Std.Dv.	N	Diff.	Std.Dv. (Diff.)	T	df	p	Confidence (-95.000%)	Confidence (+95.000%)
AGLE111	57.08333	8.17378								
AGLE121	45.66667	16.45563	12	11.41667	17.40668	2.272030	11	0.044150	0.356991	22.47634

Table 8: T-test for dependent samples on AGLE 111 and AGLE 121 (test group)

Group=Test T-test for Dependent Samples (Fanny data with groups) Marked differences are significant at $p < .05000$										
Variable	Mean	Std.Dv.	N	Diff.	Std.Dv. (Diff.)	t	df	p	Confidence (-95.000%)	Confidence (+95.000%)
AGLE111	58.72727	6.709559								
AGLE121	53.72727	8.295672	11	5.000000	8.683317	1.909768	10	0.085237	-0.833532	10.83353

In other words, the test group obtained an overall pass mark for both AGLE 111 and AGLE 121, whereas the control group failed in the second semester, as was the case with ECON. Graph 3 below shows that, although the throughput rate of the test group was slightly lower than that of the control group, the former was higher than the latter in the second semester.

Graph 3: Throughput rates for AGLE 111 and AGLE 121 (test group vs. control group)



	AGLE 111	AGLE 121
Throughput rate (Control)	91.6	75
Throughput rate (Test)	90.9	95.8

Both in terms of ECON and AGLE, it would therefore seem that the control group performed better on means in the second semester, even if this difference is not statistically significant. Most tellingly, the control group went from a pass mark to a fail mark in both ECON and AGLE from semester 1 to semester 2, whereas the test group maintained a pass mark in both semesters in both subjects.

3.5.3 The average marks

So far, the statistical analyses of the data have shown that the exposure to SLS only had a marginal impact in terms of comprehension in ECON, but nevertheless a near-statistically significant difference favouring the test group was found in terms of academic literacy. To further investigate this trend, and to confirm these results, a further analysis was carried out using a different approach: A *t*-test for independent samples was applied to the average marks (see Table 9). The average marks used in this specific analysis are the following: the year average (AVG year), the year average excluding the AGLE and ECON modules (AVG year without AGLE and ECON), the averages for the first and second semesters (AVG Sem 1 and AVG Sem 2) and the semester averages excluding the AGLE and ECON modules (AVG Sem 1 without AGLE and ECON and AVG Sem 2 without AGLE and ECON). Should the difference between the two groups once again favour the test group, it could be assumed that the intervention had a positive impact on general academic literacy levels as evidenced by improved performance in all academic subjects.

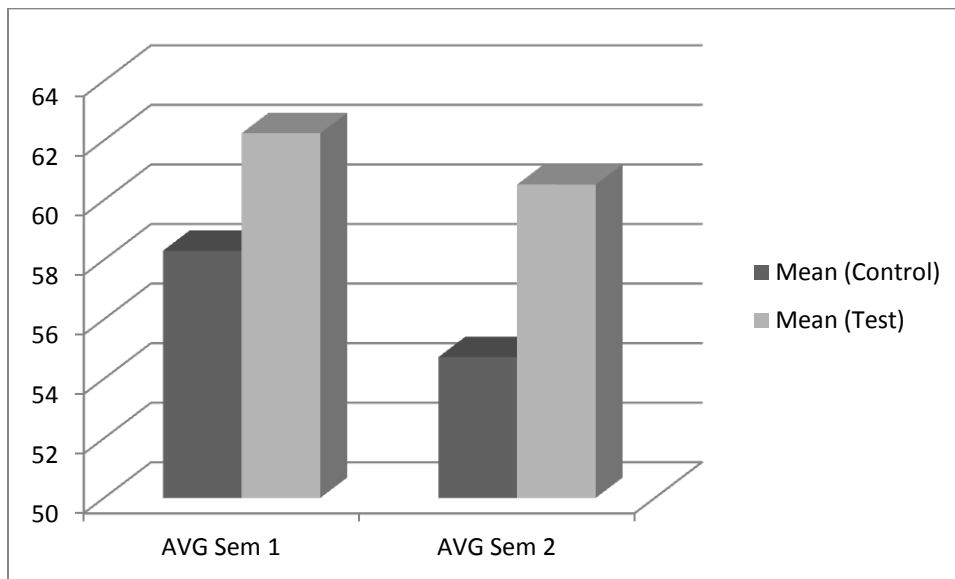
The means displayed in Table 9 below show that overall, the test group performed slightly better. It must be noted, however, that the *p*-values are all greater than 0.05, which indicates that, for all data sets, the difference between the control and the test group is not to be regarded as significant. Nevertheless, it may be interesting to note that of all the *p*-values listed in Table 9, the *p*-value yielded by the statistical analysis of the data related to the second semester average including AGLE and ECON (AVG Sem 2), is the closest to significance ($p = 0.094602$).

Table 9: T-test for independent samples on the average marks (test group vs. control group)

Variable	All Groups T-tests; Grouping: Group (Fanny data with groups) Group 1: Control Group 2: Test										
	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
AVG year	53.71014	59.09494	-1.59281	44	0.118363	22	24	10.23221	12.46480	1.483992	0.366932
AVG Sem 1	58.30184	62.24573	-1.24896	44	0.218285	22	24	10.50412	10.87262	1.071393	0.878301
AVG Sem 2	54.72749	60.52321	-1.70843	44	0.094602	22	24	9.87177	12.79574	1.680123	0.236332

In other words, the p -value is significant at the 90% confidence level, which points towards the fact that, although not statistically significant, the difference in performance between the test and the control group is more pronounced in the second semester. Graph 4 below illustrates this.

Graph 4: Mean scores for the average marks of the first and second semesters (test group vs. control group)



	AVG Sem 1	AVG Sem 2
Mean (Control)	58.30184	54.72749
Mean (Test)	62.24573	60.52321

3.5.4 Summary of the findings

The results of the statistical analyses described above show that, for both ECON and AGLE, the test group obtained an overall pass mark both in the first and second semesters, whereas the control group went from an average pass mark in the first semester to a fail mark in the second semester. As a result, the throughput rate within the test group is higher than the throughput rate within the control group for both ECON 121 and AGLE 121. Furthermore, a similar trend could be noted as far as the average semester marks (AVG Sem 1 and AVG Sem 2) are concerned: Table 9 shows that the means related to the test group

are consistently higher than the means related to the control group, with the difference becoming even more pronounced in the second semester. Indeed, the statistical analysis of the data related to AVG Sem 2 indicates significance at the 90% confidence level ($p < 0.1$) in favour of the test group. This suggests that the exposure to SLS during classes was beneficial for the test group, both in terms of subject-specific comprehension and academic literacy.

3.6 Conclusion

If, as the ECON 121 lecturer's comments have indicated, the SLS are to be considered as "Good" in terms of their conveying of core concepts, one may wonder why the statistical analyses of the ECON marks pointed towards the fact that the intervention had not had a more pronounced impact on comprehension. The following hypotheses are suggested:

- Despite the fact that the SLS conveyed the core concepts adequately, the original text may have been edited too extensively for the SLS to fulfil their role as learning support.
- Another hypothesis is that the anticipated benefits of the double exposure (both visual and auditory) were compromised by the delay between the utterance of the lecturer and the appearance of the SLS on screen. It was assumed that the delay between the lecturer's utterances and the appearance of the SLS on screen – which is on average 4-7 seconds for subtitles produced with Dragon Naturally Speaking (Romero-Fresco, 2011:65), regardless of the respeaker's skills – compromised the benefits of the double-exposure. The participants would hear an utterance, but would read a subtitle corresponding to a previous utterance, thus creating confusion.
- The reading speed of the participants may also be a determining factor. Indeed, if the SLS appear on and disappear off the screen at a speed higher than the reading speed of the participants, the latter will not be able to keep up with the information. As indicated, the average reading speed

of students on the Vaal Triangle Campus of NWU is fairly low, however, this aspect could not be tested empirically in this phase.

- Due to a miscommunication between the researcher and the lecturer, no attendance register was kept, which makes it impossible to determine which participants actually attended the majority of the lectures that were respoken, and could therefore be said to have been exposed to the subtitles.
- It could also be that the students did not actually watch the image projected on the screen during the classes or that they did not read the live SLS as they appeared, focusing their attention on the lecturer instead. This could not be determined in class, as each student would have had to be equipped with an eye-tracker, or would have had to have been observed in another way.
- The fact that the participants were exposed to the SLS during only 5 lectures may represent yet another factor. The intervention had been planned to take place over the entire second semester (i.e.12 weeks). However, due to technical constraints, class cancellations and evaluations, only 5 lectures were respoken. This may have been too little for the participants to get used to, and benefit from, the mode.

When these limitations were identified, it became obvious that the first cycle results could not be used to either confirm or reject the hypothesis that SLS has a positive effect on comprehension and AL levels with certainty, although there are already some positive signs. This gave rise to a revision of the research method in a second cycle of research. In this new cycle, the limitations were addressed as follows: The live SLS produced via respoken were replaced with synchronised offline SLS, i.e. SLS that were created using subtitling software after the lecture. The reason why it was decided to introduce synchronised offline subtitles in the second cycle of research is that they would offer the advantages that the editing of the text would not be as extensive, since the subtitles would be created after the class as opposed to live subtitles; the participants would

actually benefit from the double exposure, since there would be no delay between the lecturer's utterances and the subtitles; the reading speed of the subtitles could be adjusted so as to match the reading speed of the participants; and the latter would not be tempted to split their attention between the lecturer and the SLS, since the intervention would take place after the regular ECON lectures, and all participants would view the video.

The second research cycle and its outcomes are described in detail in the next chapter.

Chapter 4 The second research cycle

4.1 Introduction

Based on the principle of action research, the first cycle of research is followed by as many new cycles as may be necessary to reach the optimal solution to the problem which prompted the research in the first place. Due to a number of constraints, which were described in the previous chapter, the first research cycle did not lead to a confident conclusion regarding the impact of SLS via respeaking on the subject-specific comprehension of the participants, although some positive trends could be observed. Indeed, the statistical analysis of the data related to the participants' performance in terms of the academic literacy module AGLE 121 pointed towards the fact that the test group had benefited from the SLS, which was also confirmed to some extent by the performance in ECON121. Although both groups actually did worse in the second semester than in the first, in both subjects, it is important to highlight that the test group maintained a pass average of approximately 53%, while the control group obtained an overall fail mark. However, in terms of academic literacy, the very low number of students from the test and control groups who did both AGLE 111 and 121 makes these results less reliable.

In order to refine the design of the intervention, and therefore to reach a more conclusive outcome in terms of comprehension and receptive academic literacy abilities, a second research cycle was planned and implemented. This chapter discusses the methodology of this second cycle, and reports and interprets the statistical analysis of the data.

4.2 Methodology

4.2.1 The new design

The new design for the second cycle of study involved exposing the participants to synchronised offline SLS as opposed to live SLS via respeaking. Indeed, offline subtitles have the following advantages:

- Since the subtitles are not created in a live environment, the scope for inaccuracies and extensive editing is limited;
- Offline subtitles are synchronised to the speaker's utterances. There is therefore no delay, which means the participants in the study will be able to fully enjoy the benefits of the double exposure;
- The speed at which offline subtitles come on and off the screen can be adapted to the audience's needs or reading speed; and
- The participants' attention is not split between two different sources of information (e.g. the lecturer and the live subtitled video), but is focused on one source (the subtitled video).

At a practical level, and in the context of the optimal and cost-effective implementation of SLS in the classroom, offline subtitles are also cheaper to produce than SLS via respeaking. The latter is a costly activity in terms of equipment and personnel, and the preparation required to achieve optimal accuracy levels is also time consuming. Indeed, it requires that a professional respeaker be hired, or that the respeaker be sent for extensive training. It also requires more expensive equipment to provide the live feed to the respeaker and carries a far greater risk of technical difficulties.

Furthermore, as mentioned in Chapter 2, a number of studies previously showed that offline SLS do have a positive impact on both comprehension (Garza, 1991; Neuman & Koskinen, 1992:103-104; Markham, 1993, 1999; Guillory, 1998; Huang & Eskey, 2000; Bird & Williams, 2002; Caimi, 2006) and academic literacy (Kothari *et al.*, 2002; Gottlieb, 2005; Ayonghe, 2009; Linebarger *et al.* 2010:164).

However, this conclusion required further investigation in the context of this cycle, as the aforementioned studies were not carried out in the same conditions as the present study. Indeed, some of these studies investigated the impact of SLS in a foreign language learning context, as opposed to an EAL context (Garza, 1991; Guillory, 1998; Caimi, 2006) or were based on subtitled film or TV programmes as audiovisual material (Neuman & Koskinen, 1992:103-104; Markham, 1993, 1999; Huang & Eskey, 2000; Bird & Williams, 2002; Kothari *et al.*, 2002; Gottlieb, 2005; Ayonghe, 2009; Linebarger *et al.* 2010:164). The impact of SLS on subject-specific comprehension and academic literacy based on the subtitling of actual lecture content in an EAL context was not investigated.

Another difference that is worth mentioning is the limited number and/or length of research sessions in most of the studies referred to above. For instance, the participants in Markham's study (1999) watched two videos of 12 and 13 minutes each and Garza's study (1991) relied on five video segments (in English and in Russian), each of two to four minutes in length. In contrast to this, the present study investigates the impact of SLS on comprehension and academic literacy over a whole academic semester.

Thus, as per the aims of the study, the second research cycle seeks to determine whether SLS have a positive impact on subject-specific comprehension and receptive academic literacy abilities. In order to do so, it introduced offline SLS, with a view to eliminating the variables and constraints identified in the context of the first cycle. It is anticipated that the new research design will yield more reliable information regarding the impact of SLS on academic literacy and comprehension, insofar as it will rule out the problems linked to the extensive editing of the SLS, the delay between the utterances of the lecturer and the appearance of the SLS on screen, the reading speed and the split attention of the participants.

4.2.2 The module and the participants

The module selected for the second cycle remained ECON, but because the intervention was scheduled to take place during the first semester following the semester in which ECON 121 was used during the first cycle, ECON 111 lectures were used. The participants in this research cycle were students registered for the Critical Thinking Skills module (CTSS). Typically, students registered for CTSS are part of an extended programme which aims at providing the students with additional support in order to help improve their general performance and academic success. It was therefore thought that CTSS students would particularly benefit from an intervention aiming at improving their comprehension and academic literacy levels. As an additional requirement, these students also had to be registered for ECON 111. In total, 139 students gave their consent to take part in this study by signing the consent form (see Addendum G).

4.2.3 The experiment

4.2.3.1 Reading speed

From 12 April 2011, each ECON 111 lecture scheduled on Thursdays at 2:00 pm was video-recorded and the video clips were subsequently subtitled using the subtitling software Tempo (from Cavena). The reading speed used for creating the subtitles was around 130 words per minute (wpm). At the start of the study, data related to the reading speed of the participants was collected from the Reading Laboratory, in order to ensure that the speed of the subtitles would not be too high for the participants. The data indicates that at the start of the study, the average reading speed of the participants was 217 wpm with approximately 79% comprehension. Although the average reading speed is not adequate as far as NWU's requirements are concerned (420 wpm with 80% comprehension), the average reading speed is sufficient for the participants to be able to keep up with subtitles created at 130 wpm and the average comprehension is very close to the university's requirements. However, it should be mentioned that relevant data

could not be obtained for all 120 participants who agreed to take part in the study. Valid data on reading speed was collected for only 50 participants. The remaining 70 participants either did not complete any tasks related to reading speed and comprehension at the Reading Laboratory, or were not to be found on the list of students at all, possibly due to late registration. Also, among the 50 participants who yielded usable data, 5 had a reading speed lower than that of the subtitles.

4.2.3.2 The practical revision classes

The participants were divided into two groups: a control group and a test group. The control group was shown the video clips without subtitles during a practical revision class taking place after the lectures, scheduled every Friday at 11:00 am. The second group was shown the same video clips with subtitles, also during a practical revision class, every Monday at 14:00. It was hoped that the participants in this research cycle could attend more sessions than the participants in the first research cycle did, but due to a delayed start and classes being rescheduled or cancelled a few times, the participants were only shown four video recordings. Three of these viewings were followed by a comprehension test.

After each viewing, the participants were required to complete a comprehension test based on the topic explained in the video. The results obtained by both groups were collected and compared. It was anticipated that the test group, who were exposed to the videos including synchronised subtitles, would perform better in the test compared to the participants who viewed the videos without SLS. If such was the case, it could be argued that:

- Synchronised off-line subtitles yield positive results in terms of comprehension and academic literacy.

- The inevitable delay caused by respeaking was indeed to be considered as a factor in the failure of the live SLS to fulfil their role as learning support.
- A controlled reading speed for the SLS allowed the participants to keep up with the subtitles and therefore to retain the information.

Due to the absence of the lecturer during the practical revision classes, the students could not divide their attention between the lecturer and the video. It could therefore seem justified to state that focusing on only one source of information would contribute to improving comprehension and academic literacy. In order to measure a potential improvement in academic literacy levels, the participants were also required to complete the same TALL they had already written at the beginning of the year. This was done at the end of the research cycle. The way in which the data was collected and analysed is described in detail in the next section.

4.3 Analysis and interpretation of the data

4.3.1 Collecting the data

After each practical revision class, the participants wrote a test bearing on the contents of the recorded lecture they had watched. The marks the participants obtained for these tests did not count towards their participation mark for the semester and were recorded solely for the purpose of the second research cycle. In addition to the test marks obtained through the practical revision classes, the marks for the ECON 111 pre-exam and the ECON 111 module marks were collected. All these marks were statistically analysed using Statistica 10 (Statsoft, 2011), in order to determine whether the test group's subject-specific comprehension had indeed improved significantly compared to the control group. It was also necessary to determine whether the test group's performance in terms of academic literacy had improved compared to the performance of the

control group. In order to achieve this, the TALL marks the participants obtained at the beginning of the year were collected and at the end of the research cycle, the participants were required to write the same test again, as a post-test. The marks for this post-test were also collected, so that they could be compared to the pre-test.

4.3.2 The ECON evaluations

The purpose of the statistical analysis of the ECON 111 marks was to determine whether the results obtained by the test group reflected an improvement in terms of comprehension compared to the control group. The data was deemed to lend itself to an analysis using a *t*-test, since two independent groups, the control and the test group, had to be compared based on their average score on a quantitative variable (Pietersen & Maree, 2010:225). However, before the statistical analysis was carried out, the marks for all three tests were subjected to the Shapiro-Wilk normality test. The missing data was deleted casewise, so that only the participants who actually completed the tests would be taken into account. The normality test indicated that the marks for each test were normally distributed ($p > .05$ in all cases), thus allowing the use of a *t*-test. The marks for all three tests were analysed using a *t*-test for independent samples (see Tables 10, 11 and 12).

The means displayed in Table 10 show that both groups obtained overall pass marks for Test 1 and that the test group performed slightly better than the control group in Test 1 (73.9 approximately for the test group and 72.6 approximately for the control group). However, the *p*-value indicates that this difference in performance is not significant.

In Table 11, the means show that in Test 2, both groups obtained overall pass marks, as was the case in Test 1. In Test 2, however, the control group performed better than the test group (53.8 approximately for the test group and

58.2 approximately for the control group), although the difference in performance is not to be considered significant ($p > .05$).

In Table 12, the means show that both groups obtained overall pass marks and performed at almost exactly the same level in Test 3 (65.5 approximately for the test group and 65.8 approximately for the control group). Once again, no significant difference can be observed between the two groups.

Table 10: T-test for independent samples with Test 1 (test vs. control group)

Variable	T-tests; Grouping: Group (Casewise deletion of missing data) (All marks)										
	Group 1: Control Group 2: Test										
	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
Test 1	72.64000	73.86667	-0.346313	78	0.730040	50	30	16.03664	14.07794	1.297623	0.457387

Table 11: T-test for independent samples with Test 2 (test vs. control group)

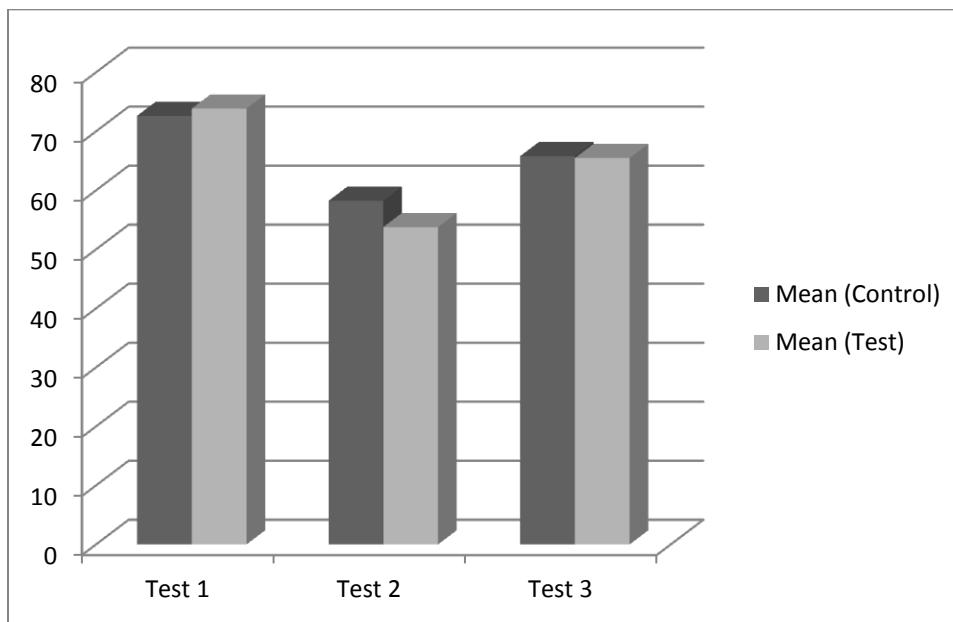
Variable	T-tests; Grouping: Group (Casewise deletion of missing data) (All marks)										
	Group 1: Control Group 2: Test										
	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
Test 2	58.24000	53.78571	1.367539	76	0.175487	50	28	12.83579	15.39446	1.438413	0.265198

Table 12: T-test for independent samples on Test 3 (test vs. control group)

Variable	T-tests; Grouping: Group (Casewise deletion of missing data) (All marks)										
	Group 1: Control Group 2: Test										
	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
Test 3	65.80882	65.48387	0.076162	97	0.939447	68	31	20.23390	18.40991	1.207969	0.577085

Graph 5 below shows the mean scores for both the control and the test group in all three tests and confirms that the test group's mean score is higher than that of the control group in Test 1, but lower in Tests 2 and 3. However, the statistical analyses discussed above indicate that the difference in means is not statistically significant. It could therefore be concluded that the exposure to SLS did not have any impact on subject-specific comprehension as far as these three tests are concerned. However, as will be discussed below, there was a particular confounding variable that could very well explain this lack of difference.

Graph 5: Mean scores for Tests 1, 2 and 3 (test group vs. control group)



	Test 1	Test 2	Test 3
Mean (Control)	72.64	58.24	65.80882
Mean (Test)	73.86667	53.78571	65.48387

In order to put this conclusion to the test, the marks for Tests 1 and 3 were compared using a *t*-test for independent samples (see Table 13). This was done to make provision for the possibility that the participants may not have had enough time to get used to the mode within the timeframe between Test 1 and Test 2. If this was indeed the case, comparing the first and last test may show a more significant improvement over time, even if the number of practical revision

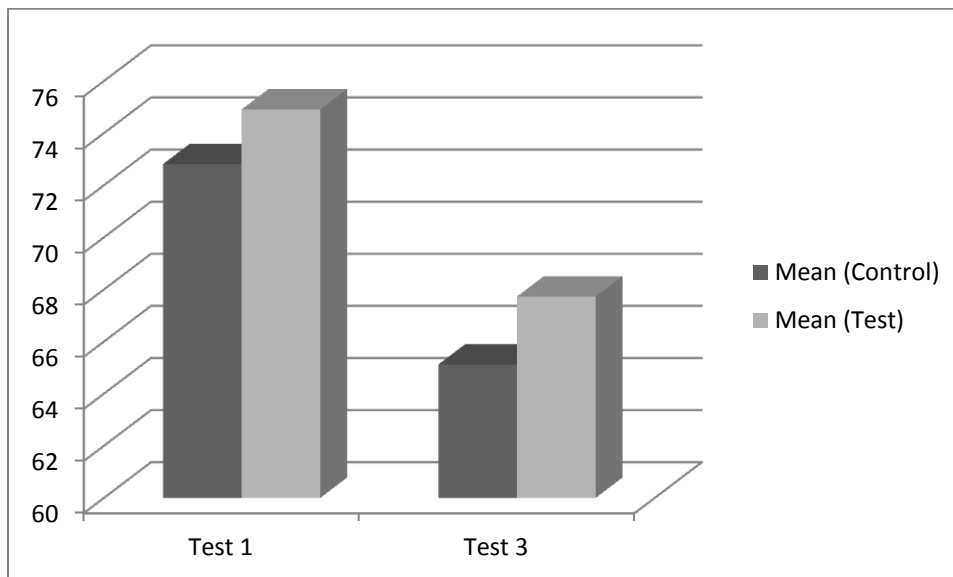
classes was not as high as it was hoped it would be. As in the previous *t*-tests, the missing data was deleted casewise. This was done so that only the participants who had completed both Test 1 and Test 3 would be taken into account. However, this introduced the following discrepancies: the data displayed in Table 13 shows that the test group's mean for Test 1 is slightly higher than in Table 10. It also shows that the test group did better than the control group in Test 3, whereas Table 12 indicates the opposite. These discrepancies are due to the casewise deletion of missing data, which eliminated the marks of all participants who did not complete both tests. Nevertheless, the results of the analysis show no significant difference between the performance of the test and control group, despite the fact that the means for the test group are slightly higher than the means for the control group.

Table 13: T-test for independent sample on Tests 1 and 3 (test group vs. control group)

Variable	T-tests; Grouping: Group (Casewise deletion of missing data) (All marks) Group 1: Control Group 2: Test										
	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
Test 1	72.80952	74.90909	-0.481293	62	0.632003	42	22	16.90755	15.90720	1.129728	0.782899
Test 3	65.11905	67.72727	-0.483850	62	0.630197	42	22	20.25713	20.91521	1.066028	0.834735

Graph 6 below shows the mean scores for both the control and the test group in Tests 1 and 3, based on the data displayed in Table 13. This representation of the means clearly indicates that, if only the participants who completed both Test 1 and Test 3 are taken into account, the test group did slightly better than the control group in both of these tests. It also shows that, although both groups obtained lower marks on average in Test 3, the test group's performance remained better than that of the control group. As discussed above, this contradicts the results displayed in Table 12, as the latter indicates that the test group did slightly worse than the control group. As mentioned above, the discrepancies are due to the casewise deletion of missing data. However, it also makes it clear that the difference between the Test 1 mean and the Test 3 mean is practically the same for both groups and that, as a result, it cannot be argued that the test group's performance was "less worse" than the performance of the control group. It may therefore be concluded that, as far as Comprehension Tests 1, 2 and 3 are concerned, exposure to SLS does not seem to have had any impact.

Graph 6: Mean scores for Tests 1 and 3 (test vs. control group)



	Test 1	Test 3
Mean (Control)	72.80952	65.11905
Mean (Test)	74.90909	67.72727

The following factors may have prevented the intervention from leading to an improvement in subject-specific comprehension in the test group: First of all, the tests, although set by the official ECON 111 facilitator, may not have tested the comprehension adequately as the tests had a very limited scope. The results of the tests may therefore not be an adequate reflection of the participants' comprehension of the academic material. Secondly, and most importantly, the ECON 111 lecturer made extensive use of slides during lectures. In the context of an eye-tracking study done on one of the recorded lectures used for this cycle, aiming at optimising subtitles, Kruger (2011) found that both subtitles and slides improved comprehension. In particular, a closer inspection of the video revealed that most of the information in the subtitles was also available in the PowerPoint slides, with the important difference that the information on the slides stayed on screen much longer. Therefore, the control group also had access to textual support, in the form of the slides. As a result, it could be said that the SLS did not actually add any value compared to the slides, which explains why no significantly better performance was recorded as far as the test group is concerned. The test group may actually have been disadvantaged in the sense that their attention was split between the SLS and the slides. If they concentrated on the SLS, they could not look at the slides and vice versa.⁷

Although the exposure to offline subtitles did not seem to have had any impact on the performance of the test group, presumably for the reasons mentioned above, it may be interesting to find out whether they may have had a positive effect on the marks obtained by the same group for evaluations completed in class as opposed to during the practical revision classes. Two marks were collected with a view to this analysis: the marks obtained for a pre-examination evaluation the participants wrote in one of their ECON 111 classes and the ECON 111 module marks, composed of the examination mark and the participation mark. These marks were selected because they corresponded to

⁷ Kruger's (2011) findings emphasise the fact that textual support per se has a positive impact on comprehension and that it is necessary to achieve a balance between the use of slides and the use of subtitles.

the only two evaluations all students taking ECON 111 wrote in common.

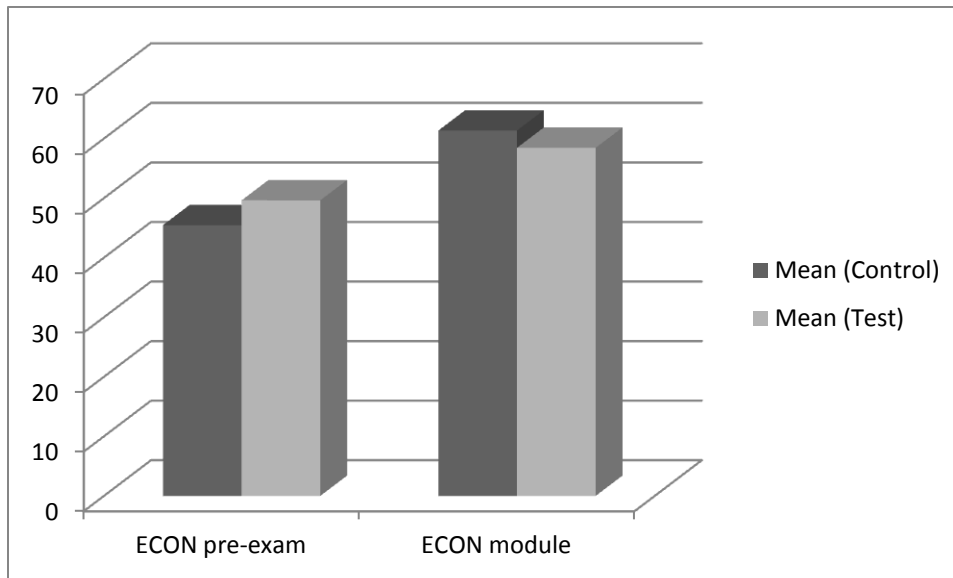
The marks for the ECON 111 pre-examination and the ECON 111 module marks were subjected to the Shapiro-Wilk normality test, which established that the marks were normally distributed. They were analysed using a t -test for independent samples (see Table 14). The means displayed in Table 14 show that, as far as the pre-examination is concerned, the test group performed better than the control group in the pre-examination. Indeed, the mean for the test group is approximately 49.6 and the mean for the control group, approximately 45.5. However, the p -value indicates that this difference between the two groups is not to be considered significant ($p > .05$). On the other hand, the data shows that, in the case of the ECON 111 module marks, the control group performed slightly better: the mean for the control group is approximately 61.3, while the mean for the test group is approximately 58.4. However, once again, the difference is not significant, as indicated by the p value ($p > .05$).

Table 14: T-test for independent samples on the ECON pre-exam and module marks (test group vs. control group)

Variable	T-tests; Grouping: Group (Casewise deletion of missing data) (All marks) Group 1: Control Group 2: Test										
	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
ECON pre-exam	45.46667	49.62963	-1.04720	70	0.298609	45	27	18.69443	11.24944	2.761614	0.007231
ECON module	61.34667	58.44737	1.13753	111	0.257765	75	38	9.29326	17.85482	3.691259	0.000002

Graph 7 below shows the mean scores of each group for both the ECON pre-exam and the ECON module marks.

Graph 7: Mean scores for the ECON pre-exam and module marks (test group vs. control group)



	ECON pre-exam	ECON module
Mean (Control)	45.46667	61.34667
Mean (Test)	49.62963	58.44737

Based on the statistical analyses above, it can be concluded that the exposure to offline SLS did not enhance the test group’s comprehension of the content of ECON 111 lectures, at least in the presence of slides also containing the information, which makes it very difficult to conclude anything about the isolated role of the subtitles.

4.3.3 The TALL marks

In order to determine whether the offline subtitles led to an improvement in the receptive academic literacy ability of the test group, the marks obtained by the participants for the TALL pre- and post-tests were analysed using t-tests, after they were found to be normally distributed by the Shapiro-Wilk normality test.

First of all, the pre-test results obtained by the participants in both groups were compared using a *t*-test for independent samples, in order to determine whether the groups performed at the same level before the intervention (see Table 15). The pre-test consisted of the TALL that all first-year students have to write at the beginning of the academic year.

The mean values displayed in Table 15 indicate that both the control and the test groups obtained overall fail marks and that their respective performances in the pre-test were very similar. This is confirmed by the *p*-value, which does not point towards any significant difference between the results of the test group and of the control group ($p > .05$). Then, the results for the pre- and post-tests obtained by the participants in the control group were analysed using a *t*-test for dependent samples (see Table 16).

The mean values in table 16 show that the participants in the control group obtained higher marks in the post-test, although they were not exposed to offline subtitles. However, the post-test overall mark obtained by the control group still indicates an average below the pass mark of 50. Besides, the *p*-value, being greater than .05, indicates that this difference in performance is not to be considered significant, even though the *p* value is actually very close to significance.

Table 15: T-test for independent samples on the TALL pre-test marks (test group vs. control group)

Variable	T-tests; Grouping: Group (Casewise deletion of missing data) (All marks) Group 1: Control Group 2: Test										
	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
TALL pre-test	43.18571	42.41936	0.281611	99	0.778830	70	31	11.14632	15.46992	1.926252	0.026068

Table 16: T-test for dependent samples on TALL pre-test and post-test (control group)

Variable	Group=Control T-test for Dependent Samples (All marks) Marked differences are significant at $p < .05000$ (Casewise deletion of missing data)									
	Mean	Std.Dv.	N	Diff.	Std.Dv. (Diff.)	t	df	p	Confidence (-95.000%)	Confidence (+95.000%)
TALL pre-test	40.88000	11.41023								
TALL post-test	45.08000	12.87090	25	-4.20000	10.26726	-2.04534	24	0.051934	-8.43812	0.038117

Table 17: T-test for dependent samples on TALL pre-test and post-test (test group)

Group=Test T-test for Dependent Samples (All marks) Marked differences are significant at $p < .05000$ (Casewise deletion of missing data)										
Variable	Mean	Std.Dv.	N	Diff.	Std.Dv. (Diff.)	t	df	p	Confidence (-95.000%)	Confidence (+95.000%)
TALL pre-test	47.11765	12.94161								
TALL post-test	54.47059	12.08365	17	-7.35294	13.92812	-2.17667	16	0.044826	-14.5141	-0.191760

The same *t*-test was applied to the results for the pre- and post-test obtained by the participants in the test group (see Table 17). The mean values show that, like the control group, the test group performed better in the post-test, but unlike in the case of the control group, according to the *p*-value, the difference in performance is significant ($p < .05$). Even more importantly, the test group's performance improved to the extent that the overall mark increased from a fail mark to a pass mark on average.

According to the results displayed in Table 16, it seems as though the exposure to videos of lectures does offer some benefits in terms of academic literacy, even though these videos were not subtitled. Indeed, the control group's performance improved in the post-test, although not significantly so and although the overall post-test mark still indicates a fail on average. However, it is important to note that the *p*-value is very close to significance ($p = 0.051934$). It is possible that the fact of attending the lecture twice, although in different forms, may have led to enhanced learning. The results in Table 17, however, point towards actual significance when it comes to the improvement of the test group's academic literacy skills. It could therefore be argued that exposure to subtitled videos of lectures as a form of revision enhances performance in receptive academic literacy ability even more than the exposure to non-subtitled videos.

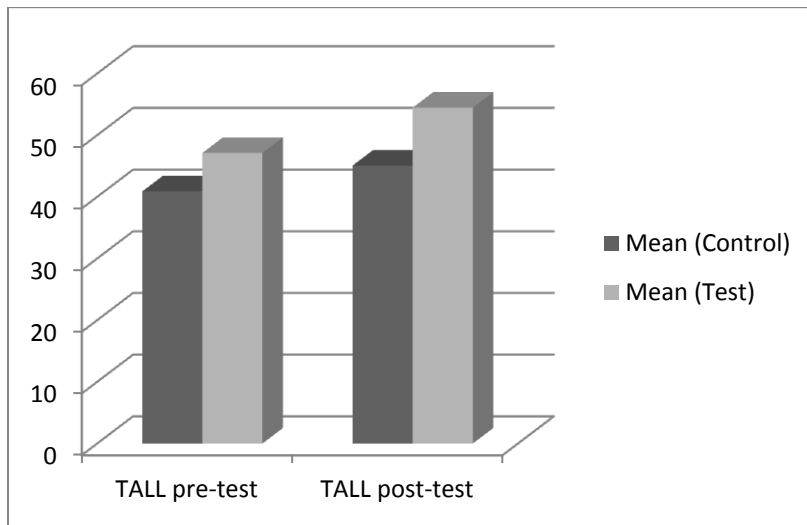
A *t*-test for independent samples carried out on the post-test results only (see Table 18) confirms the fact that the test group performed significantly better than the control group ($p < .05$).

Table 18: T-test for independent samples on the TALL post-test (test group vs. control group)

Variable	T-tests; Grouping: Group (Casewise deletion of missing data) (All marks)										
	Group 1: Control Group 2: Test										
	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
TALL post-test	44.96429	52.78947	-2.12917	45	0.038747	28	19	12.28514	12.48367	1.032583	0.918264

Graph 8 below shows the means corresponding to each group, for both the TALL pre-test and post-test and confirms that the difference in means is higher in the case of the TALL post-test than in the case of the pre-test.

Graph 8: Mean scores for the TALL pre-test and post-test (test group vs. control group)



	TALL pre-test	TALL post-test
Mean (Control)	40.88	45.08
Mean (Test)	47.11765	54.47059

The statistical analyses conducted above in the context of the second research cycle point towards the fact that exposure to offline SLS has a positive impact on receptive academic literacy ability, but no direct impact on subject-specific comprehension. The outcome in terms of academic literacy is in line with the findings of Kothari *et al.* (2002), Gottlieb (2005), Ayonghe (2009) and Linebarger *et al.* (2010), even though these studies were either not carried out in a tertiary education context (with the exception of Ayonghe, 2009) or were based on a different kind of material (subtitled popular films, in Ayonghe’s case). Indeed, these studies contend that the positive impact of SLS on literacy is due to the reading practice they offer. However, from the perspective of making academic information during lectures more accessible to students, the double exposure

(aural and written) to lectures may be the main contributing factor to gains in literacy levels, as mentioned by Spanos and Smith (1990) and Bird and Williams (2002). It may therefore be concluded that SLS have a positive impact on academic literacy, whether they are used to enhance TV programmes or video recordings of lectures. However, the benefits in terms of subject-specific comprehension, as were discussed by Neuman and Koskinen, 1992:103-104 and Vanderplank (1998, 1990) did not realise in this cycle, most likely due to the competition between the SLS and the slides used by the lecturer during class.

4.4 Conclusion

The second research cycle described in this chapter yielded results that are comparable to those of the first research cycle. Indeed, in both cases, the statistical analysis points towards the fact that the exposure to SLS (whether via respeaking or offline) was beneficial in terms of academic literacy. On the other hand, no direct significant benefit could be noted as far as subject-specific comprehension was concerned. However, the presence of slides in this cycle proved to be a confounding variable. The main difference between the outcomes of the first and the second research cycle is that in the context of the latter, the positive impact of the subtitles on academic literacy is statistically significant. The performance of the test group did not only remain constant, but was significantly stronger.

As mentioned, the main factor that influenced the outcome of the second research cycle is likely to be the competition between the SLS and the slides. This factor makes it impossible to make any confident conclusions about the impact of SLS on subject-specific comprehension. Despite the improvements made to the research design based on the findings of the first research cycle, the design for this cycle was still not optimal. As a result, a third research cycle had to be planned and implemented, so as to improve the design further. The methodology and outcome of this third cycle are discussed in the next chapter.

Chapter 5 The third research cycle

5.1 Introduction

Due to the fact that the results of the second research cycle were compromised by the confounding variable of the PowerPoint slides, which introduced a competition factor detracting which made it impossible to link improvements directly to subtitles, and therefore did not lead to any confident conclusions as far as the impact of SLS on the subject-specific comprehension of EAL students is concerned, a third research cycle had to be designed and implemented. The third research cycle was designed to further eliminate constraints that prevented conclusions to be drawn with confidence in the previous two cycles. This chapter describes the methodology of the third research cycle and reports on the statistical analysis of the data.

5.2 Methodology

5.2.1 The intervention

The design of the third research cycle was similar to that of the second research cycle, in that it involved video-recorded lectures with offline subtitles. A number of lectures were video-recorded and the videos shown to EAL students during practical revision classes. After each viewing, all participants were required to complete a short comprehension test, although the purpose of these tests was rather to motivate students to participate and to collect attendance data than to collect comprehension data, which would be collected in more extensive tests written by all students in PSYC 121.

However, it also involved a number of improvements whose purpose was to bring both the design and the methodology closer to their optimal form. Some of these

improvements were dictated by the constraints identified in the second cycle, that is to say the competition between the SLS and the slides used by the lecturer during class and the potential inadequacy of the comprehension tests, as well as by the findings reported in the previous cycles.

Firstly, it was important to select a module in which the lecturer would not make extensive use of slides during classes. Besides, communication with the Economics lecturer in the second cycle was not always optimal, so changing to a different module in the same faculty as the one in which the research was conducted would hold obvious benefits. The first-year, second-semester psychology module PSYC 121 was therefore selected, after discussing the study with the relevant director and lecturer. It complied with the same requirements as the first two cycles, namely large student numbers, a fairly low throughput rate, and subject matter involving the mastering of specific subject knowledge. The students willing to take part in the study were requested to complete and sign a consent form (see Addendum H). At that stage, they were also told that, since this intervention was designed to test the impact of SLS on subject-specific comprehension, they should make a reasonable attempt to read the SLS. The students were also informed that, should they elect to participate, the comprehension tests would contribute an optional additional mark when combined that would count towards their participation mark, in order to ensure regular attendance on the part of the student. Indeed, it was essential that the participants attend as many of the practical revision classes as possible to enjoy the full benefits of the SLS, as previously discussed in chapters 3 and 4. The comprehension tests were consequently used to identify the participants who had attended at least four of the five additional sessions. This will be discussed in more detail further in this section.

Secondly, all participants watched videos with subtitles. The experiment did not involve any videos without subtitles. The reason for this was that this research cycle was designed for the purpose of determining whether the intervention

(video with subtitles) had advantages in terms of subject-specific comprehension, and not to determine the difference in impact between subtitled and unsubtitled videos. The test group therefore consisted of the participants in the study (i.e. the students who attended the practical revision classes, watched the subtitled videos and wrote the comprehension tests). The control group consisted of the students who did not take part in the experiment at all, and therefore did not watch any of the videos and did not write any of the tests. The way in which the data gathered in the context of this new approach was used, is described in the next section.

Thirdly, unlike the first and second cycles, the third cycle did not investigate the impact of SLS on the receptive English AL ability of the students, as measured by an instrument like TALL or performance in the academic literacy module AGLE121. The reason for this is that the second research cycle had already pointed towards the fact that SLS had a positive impact on receptive academic literacy ability, thus confirming Ayonghe's (2009:172) finding that "subtitling offers a powerful tool in the context of AL support". Therefore, as far as this cycle is concerned, the focus was restricted to subject-specific comprehension, an important component of academic literacy in itself, but also the one element for which no conclusive evidence of improvement could be found in cycles 1 and 2.

Based on the findings of Garza (1991), Bird and Williams (2002) and Ayonghe (2009), who determined that SLS improve listening comprehension and more specifically the listening comprehension of native-English speech patterns in EAL learners, and on the findings of Vanderplank (1988, 1990), who argues that SLS facilitate access to the target language, thus enhancing comprehension and learning, it stands to reason that being exposed to SLS during lectures would help students optimize the time spent in class with regard to the potential benefits of the double exposure inherent to the mode. It also stands to reason that the optimization of the time spent during lectures would translate into improved comprehension of the material being presented. Furthermore, Neuman and

Koskinen (1992:103-104) found that the performance of bilingual students increased substantially in terms of content learning assessments, which justifies the hypothesis that exposure to SLS has the potential to improve subject-specific comprehension. This could, however, not be proven in the previous research cycle, due to the presence of slides during lectures.

In this cycle, subject-specific comprehension was measured by means of academic performance in Psychology, based on the results of an official class test compiled by the lecturer (to be distinguished from the comprehension tests the participants wrote during the practical revision classes that were much more limited in scope and prone to the same shortcomings as those written in the second cycle) and of a semester test covering the work presented in the subtitled videos.

5.2.2 Collecting and analysing the data

This intervention consisted of five subtitled video recordings corresponding to the first six lectures in PSYC121 (the first video contained two lectures) and of five comprehension tests. The tests were given to the participants directly after they had watched the corresponding video, in the context of a practical revision class. The first test (Test 1) was set in order to test the comprehension of the contents presented during two classes. The second test (Test 2) evaluated the comprehension of the third class, Test 3 the comprehension of the fourth class, and so on. As mentioned previously in this section, these comprehension tests were used in order to monitor the attendance of the participants and to encourage them to pay attention, rather than to evaluate short-term comprehension. Indeed, this cycle aimed at determining whether exposure to SLS help improve the global subject-specific comprehension of EAL students, as opposed to short-term comprehension, based on a single specific test. Therefore, for the purposes of data analysis, the comprehension test marks were only used to find out how many videos each participant had watched. In summary then, the

marks used in order to determine the impact of SLS on subject-specific comprehension statistically were the following: the results of the first official class test, which evaluated the comprehension of the first three classes, and thus covered the work done in the first two videos; and the results of the semester test, which was written after the participants watched the five videos, and covered the work done in all six lectures concerned. Before it was analysed, the data was cleaned up as follows:

First of all, since not all participants were present at each practical revision class, only the class test marks of participants who had written comprehension tests 1 and 2 (and therefore watched the first three videos) were used. Similarly, only the semester test marks of participants who wrote at least four of the five tests written during practical revision classes were taken into account. In this way, it could be ensured that the participants whose marks were analysed statistically had been exposed to a sufficient number of subtitled recordings of the lectures before the class test and the semester test to be able to arrive at any conclusions about the impact of the intervention.

Secondly, the participants who indicated Afrikaans as their preferred language on the official PSYC 121 class list were not taken into account. The reason for this was that Afrikaans-speaking students have the possibility to attend the PSYC 121 classes in Afrikaans, thus creating a language variable, in the sense that some of them may have attended the Afrikaans classes but watched the videos in English. The Afrikaans-speaking students were therefore removed from the list of participants in order to eliminate the language variable and thus allow the intervention to focus on the participants who had both attended the classes and viewed the videos in English. This was also done since the main focus of this study is on the impact of SLS in an EAL context.

Thirdly, all participants who obtained a mark of zero were deleted from the class test list or the semester test list, depending on the test for which they got a zero.

Indeed, the marks list did not indicate whether a zero meant that the participant in question had not been able to provide any correct answer to the test or whether they had simply not written the test at all. Since both these tests were quite extensive in scope, a mark of zero was highly unlikely.

As a result of the data being cleaned up in this way, the test group was composed of students having watched most of the subtitled recordings of classes and the control group of students who did not watch any recordings. This way, the emphasis would be on the potential benefits of an intervention where participants were exposed to subtitled video compared to no intervention being carried out at all other than the normal lectures in PSYC 121.

5.3 Interpretation of the data

5.3.1 The class test

After the data was cleaned up, the control group turned out to be almost twice as large as the test group (131 participants in the control group compared to 71 in the test group). As a result, the control group was divided randomly into two sub-groups of 65 (Set 1) and 66 (Set 2) participants respectively before the data was analysed, so that the size of the control and the test groups would be comparable. Indeed, such a large difference in the size of the two groups is likely to skew the results. The groups were created using the website Research Randomizer. Care was taken not to include overlapping numbers. Where overlapping numbers were found between the two sub-sets, they were replaced with the nearest available lower or higher value.

The data was then subjected to the Shapiro Wilk W normality test, which showed that, for each of the samples, the data was not normally distributed ($p = .00223$ for the group of 65 and $p = .00350$ for the group of 66). Therefore, a non-parametric equivalent of the t -test for independent samples, the Mann-Whitney U test, was

used (See Tables 19 and 20). The results displayed in Tables 19 and 20 show that there is no significant difference between the performance of the two sets of the control group and the performance of the test group as far as the class test is concerned. It therefore seems as though, at this stage of the intervention, exposure to the SLS did not have any impact on the subject-specific comprehension of the test group. However, it must be noted that the participants wrote the class test after viewing only two of the five videos. The number of viewings may not have been sufficient for the participants to get used to the mode. The results of the statistical analysis of the data related to the semester test will provide some further information.

Table 19: Mann-Whitney U test on the class test marks (test group vs. sample 1 of control group)

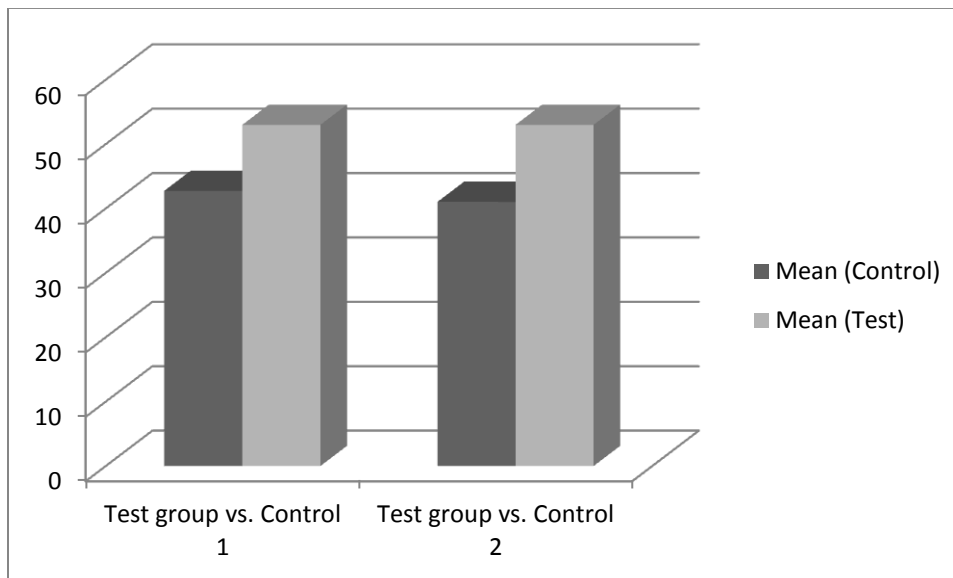
Mann-Whitney U Test (MPSJ008 in Class test_control group_sample 1) By variable Group Marked tests are significant at p < .05000										
Variable	Rank Sum (Control)	Rank Sum (Test)	U	Z	p-value	Z (adjusted)	p-value	Valid N (Control)	Valid N (Test)	2*1sided (exact p)
Class test	4542.500	4773.500	2217.500	0.389913	0.696601	0.394279	0.693375	65	71	0.695907

Table 20: Mann-Whitney U test on the class test (test group vs. sample 2 of control group)

Mann-Whitney U Test (Sheet 1 in Class test_control group_sample 2) By variable Group Marked tests are significant at p < .05000										
Variable	Rank Sum (Control)	Rank Sum (Test)	U	Z	p-value	Z (adjusted)	p-value	Valid N (Control)	Valid N (Test)	2*1sided (exact p)
Class test	4452.500	5000.500	2241.500	-0.435082	0.663503	-0.440663	0.659458	66	71	0.662922

Graph 9 below illustrates the difference in means between the test group and Sample 1 of the control group and between the test group and Sample 2 of the control group, as far as the class test is concerned. Since the Mann-Whitney U test does not calculate the means, these were calculated separately for each group. Although the series may point towards a large difference in performance between the test and the control group, the values on the vertical axis are very close to each other. This indicates that the differences in means are very small, or, as shown in Tables 19 and 20, not statistically significant.

Graph 9: Mean scores for the class test (test group vs. control group)



	Test group vs. Control 1	Test group vs. Control 2
Mean (Control)	35.4615	34.0151
Mean (Test)	34.5774	34.5774

5.3.2 The semester test

The purpose of the semester test was to evaluate how well the students have assimilated the academic content presented in lectures up to that point (i.e. half-way through the semester). By the time the semester test was written, the participants in the test group had watched six recorded lectures with subtitles (in

five videos). Due to the fact that the control group was again substantially larger than the test group after the data was cleaned up (146 participants in the control group and 56 in the test group), the control group was randomly divided into two sub-sets of 56 students, using Research Randomizer. Care was taken not to include overlapping numbers. Where overlapping numbers were found between the two sub-sets, they were replaced with the nearest available lower or higher value.

Both data sets were then analysed in terms of normality using the Shapiro Wilk W normality test. The test showed the data to be normally distributed in each case. A *t*-test for independent samples was therefore used in order to analyse the data. The results of the statistical analysis are displayed below in Tables 21 and 22.

The results displayed in Tables 21 and 22 show that, in each case, the test group performed significantly better than the control group in the semester test. This stands in contrast to the lack of significant difference between the two groups as far as the class test is concerned. Indeed, the test group obtained an overall pass mark of 53%, while both samples from the control group failed with means of approximately 43 and 41 respectively.

Table 21: T-test for independent samples on the semester test (test group vs. sample 1 of the control)

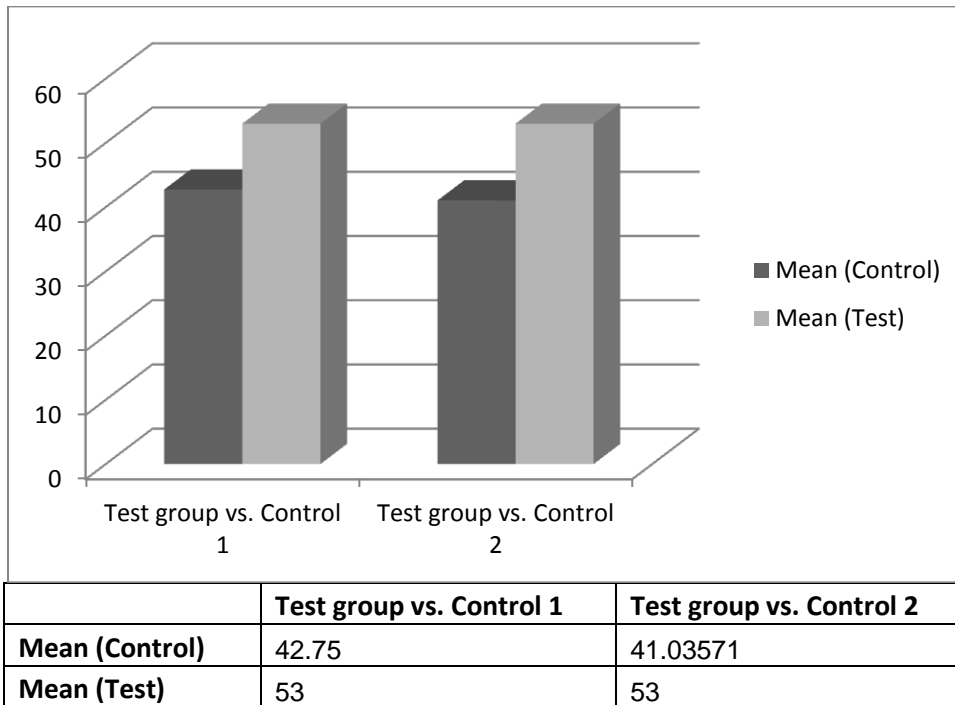
T-tests; Grouping: Group (MPSJ008 in Semester test_control group_sample 1)											
Group 1: Control											
Group 2: Test											
Variable	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
Semester test	42.75000	53.00000	-5.04606	110	0.000002	56	56	11.22052	10.25493	1.197182	0.506770

Table 22: T-test for independent samples on the semester test (test group vs. sample 2 of the control group)

T-tests; Grouping: Group (MPSJ008 in Semester test_control group_sample 2)											
Group 1:Control											
Group 2: Test											
Variable	Mean (Control)	Mean (Test)	t-value	df	p	Valid N (Control)	Valid N (Test)	Std.Dev. (Control)	Std.Dev. (Test)	F-ratio (Variances)	p (Variances)
Semester test	41.03571	53.00000	-5.64901	110	0.000000	56	56	12.08450	10.25493	1.388646	0.226562

Graph 10 below illustrates the difference in means between the test group and Sample 1 of the control group and between the test group and Sample 2 of the control group, respectively, in the case of the semester test.

Graph 10: Mean scores for the semester test (test group vs. control group)



The fact that the test group did significantly better than the control group in the semester test corroborates the hypothesis made earlier: that by the time the participants wrote the class test, they may not yet have had enough time to get used to the mode. However, when they wrote the semester test, they may have attended a sufficient number of practical revision classes for them to get used to the mode and thus reap its benefits. Despite the fact that SLS were proven to improve comprehension after the viewing of a limited number of subtitled video recordings (Garza, 1991; Neuman & Koskinen, 1992; Markham, 1993, 1999; Huang & Eskey, 2000), the outcomes of this study seem to be that in order for SLS to have a positive impact on subject-specific comprehension, the students need to be exposed to the mode for a longer period of time, such as half a semester in this study. Indeed, the students usually complete a semester test

(the evaluation which clearly shows an improvement in terms of subject-specific comprehension on the part of the test group) mid-semester. It seems as though, in this specific context, the benefits of the double exposure in terms of comprehension, as highlighted by Bird and Williams (2002), Caimi (2006), Guillory (1998), Danan (2004), Garza (1991) and Parks (1994), may only have realized over the course of half a semester.

5.4 Conclusion

The purpose of this third research cycle was to eliminate the constraint identified in the context of the second research cycle, that is to say the competition between the SLS and the PowerPoint slides used by the lecturer during classes. However, this cycle also aimed at determining the impact of SLS on subject-specific comprehension in the longer term, instead of focusing on the individual comprehension tests written during practical revision classes, after each video. But although the comprehension tests were not used to determine whether the SLS had had an impact on subject-specific comprehension, they served two other important purposes. The first was to determine how many practical revision classes each participant had attended. This helped select the participants to be included in the test group when it came to analysing the data related to the class and semester tests. The second was to encourage students to pay attention during the additional video sessions as well as to reinforce the key concepts contained in each video.

The results of these statistical analyses indicate that, although there was no significant difference between the performance of the test group and that of the control group in the class test, the test group did significantly better than the control group in the semester test. Based on this observation alone, it could be stated that exposure to subtitled videos of lectures indeed has have a positive impact on subject-specific comprehension, provided that the students attend the practical revision classes regularly and for a longer period of time than in the first

two research cycles, so that they get the opportunity to get used to the mode. However, in the absence of a group that watched videos without subtitles, one could argue that the improvement observed in the test group may have been due to the additional exposure to the learning material, and not necessarily to the subtitles themselves.

Chapter 6 Findings, recommendations and conclusion

6.1 Introduction

This study investigated the impact of the introduction of SLS as learning support for EAL students on the Vaal Triangle Campus of North-West University who displayed risk with regard to inadequate English academic literacy levels. As was discussed comprehensively in Chapter 2, inadequate receptive academic literacy skills compromise students' ability to access and process information which inevitably lead to them underperforming academically. The purpose of the study was, therefore, to determine whether the introduction of SLS in the classroom (at first only live SLS via respeaking, but in the second and third cycles, off-line or post-production SLS) would help EAL students improve their performance in terms of their receptive AL ability and, as a result, their subject-specific comprehension. The decision to investigate the impact of both offline SLS and live SLS via respeaking in that context was informed by a literature survey dealing with a number of studies on the benefits of offline SLS in the second-language classroom and on the use of live SLS via respeaking as a learning aid for deaf or hard-of-hearing students.

The hypothesis of this study states that the exposure to SLS during classes would help improve the receptive academic literacy skills and subject-specific comprehension of EAL students. Since very little information is available on the topic in a South African context, the study was designed according to the principle of Action Research, so that the design of the empirical experiment could be reflected upon and modified if necessary. In this way, it would be possible to refine the design of the study so as to come as close as possible to the optimal design that would reliably corroborate or disprove the hypothesis.

Due to the fact that a number of constraints were experienced, the original experiment design was revised twice. The study was therefore composed of three research cycles. Their results are summarised in the following section.

6.2 Summary of the results

6.2.1 The first research cycle

The statistical analysis of the data pertaining to the first research cycle indicated that, at the beginning of the study, there was no significant difference between the respective performances of the test group and the control group in the first semester, in the case of both ECON 111 and AGLE 111. After the intervention took place (i.e. at the end of the second semester), the analysis of the data showed that the performance of both groups was significantly worse in the ECON 121 module than in ECON111: the control group's performance was 8% worse and the test group's performance approximately 6.2% worse than in the first semester. Nevertheless, the discussion highlighted the fact that, while the control group's average marks for both ECON and AGLE went from a pass to a fail, the control group passed in both semesters. A similar trend was recorded in terms of the average marks for each semester: although both groups passed both semesters on average, the test group's average marks were slightly better. This trend was more pronounced in the second semester, which is when the first research cycle took place.

It was therefore concluded that although the exposure to SLS via respeaking during ECON 121 lectures did not have any statistically significant direct impact on the subject-specific comprehension or the academic literacy levels of the participants in the test group, some positive trends in favour of the test group could be noted. A second research cycle was then designed and implemented, in order to find out whether these positive trends could be enhanced.

6.2.2 The second research cycle

The second research cycle involved the use of offline SLS instead of live SLS via respeaking. The participants in the test group watched subtitled videos of ECON 111 lectures they had already attended and the participants in the control group watched the same videos without subtitles. After each viewing, the participants were required to complete a comprehension test. The marks the participants obtained for these tests were used to determine whether the test group performed better than the control group. Other marks used for the same purpose were: the marks for the ECON 111 pre-exam, the ECON 111 module marks and the marks for the TALL (pre- and post-test).

The statistical analysis of the comprehension tests results and of other ECON results did not point towards any positive impact on comprehension, despite the exposure to subtitled videos of ECON 111 lectures. Indeed, no significant difference could be recorded between the test group's and the control group's performance. The competition between the SLS and the slides used by the ECON lecturer was thought to be the main reason why no significant difference could be noted between the performance of the test group and that of the control group.

On the other hand, the exposure to subtitles seems to have had a positive impact on the receptive academic literacy skills of the test group. Although there was no significant difference between the test and the control groups in terms of performance at the start of the study, the statistical analysis of the marks for the pre- and post-TALL indicates that the test group performed significantly better in the post-TALL than the control group. A significant improvement could also be noted in the test group's TALL marks between the pre-test and the post-test.

6.2.3 The third research cycle

Similar to the second research cycle, the third cycle involved offline SLS. It was, however, implemented in the context of a different module, where it was known that slides would be used sparingly or not at all, in order to rule out this specific constraint. Furthermore, none of the participants was exposed to videos without SLS, as the focus of this cycle was to evaluate the impact of SLS on academic literacy and subject-specific comprehension, and not the impact of subtitled videos versus unsubtitled videos. The marks used to evaluate this impact statistically were the official class test and the semester test marks.

The statistical analysis of the class test results revealed that there was no significant difference between the test group and the control group in terms of performance. However, the analysis of the semester test results showed a significantly better performance on the part of the test group, indicating benefits to subject-specific comprehension over a longer, and more sustained exposure to subtitled class recordings.

6.3 Findings

The primary aim of this study was to prove that the introduction of SLS in the classroom would improve the receptive academic literacy abilities and subject-specific comprehension of EAL students.

Based on the above summary of results, the following conclusions can be made:

- SLS via respeaking do not seem to have any impact on the subject-specific comprehension of EAL students or on their academic literacy skills. Indeed, the participants in the test group, who attended lectures with live SLS via respeaking, did not perform better in their evaluations than the control group, who attended lectures without SLS

- Offline SLS, on the other hand, were proven to have a positive impact on both academic literacy and subject-specific comprehension. In the context of the second research cycle, discussed in Chapter 4, the test group performed significantly better in the TALL post-test than in the TALL pre-test, whereas no significant difference could be recorded in terms of the control group's performance in the same test. A positive result regarding the impact of SLS on subject-specific comprehension was also obtained in the third research cycle, discussed in Chapter 5. Indeed, in this cycle, the test group's performance in the semester test was shown to be significantly better than that of the control group. However, it could not be confidently stated that this improvement was the result of the exposure to the subtitles themselves as opposed to the additional exposure to the content of the lectures.

Therefore, in the context of this study, and with the constraints experienced with the live subtitling via respeaking, offline subtitling seems to be the most effective and cost-efficient subtitling method when it comes to improving both subject-specific comprehension and receptive academic literacy ability. This is not to say, however, that under the right circumstances, and with the assistance of fully trained respeakers, live subtitling could not yield similar benefits, but this will have to be determined empirically in future research.

The fact that direct benefits of the exposure to SLS on subject-specific comprehension could only be noted when looking at the semester test results in the third cycle implies that SLS have a positive impact on long-term rather than short-term comprehension. Therefore, according to this study, students should be exposed to SLS during lectures for longer periods of time to fully enjoy the benefits of the mode.

It may be interesting to note, however, that live SLS via respeaking can be argued to have prevented the test group from experiencing a decline in

performance in the context of the first research cycle, despite the extensive editing of the SLS. Nevertheless, the benefits of offline SLS were more pronounced in this study. Importantly though, a number of factors must be taken into account when introducing offline SLS as learning support in the classroom, in order to ensure optimal benefits. The next section discusses these factors and makes recommendations towards the optimal implementation of the mode.

6.4 Constraints and the optimal design

As discussed in Chapters 3, 4 and 5, a number of factors influenced the outcomes of the different research cycles.

The first experiment focused on the use of live SLS via respeaking. The constraints that were identified in the context of this experiment (the extensive editing of the SLS, the delay, the students' reading speed and the insufficient exposure) may explain why the outcomes did not corroborate the hypothesis. Because one of the main principles of action research is that it allows for the continuous refinement of the proposed solution to a research problem, the purpose of the second research cycle was to eliminate the constraints mentioned above. The main factors involved in the decision to replace live SLS via respeaking with offline SLS in the second cycle were the fleeting nature of live SLS (the students could not go back to check comprehension) and the fact that the mode was found to be too costly and resource-intensive to be financially viable within a South African tertiary education establishment, especially if it will only be available during the lecture and not in a recorded form after the lecture to allow revision. The use of offline subtitles is more cost-effective, as the subtitled videos can be burnt onto DVDs, which have a much longer shelf-life and can be consulted at will. An offline SLS project has already been approved in principle by Management on the Vaal Triangle Campus of North-West University, expanding on the work done in this study.

As mentioned above, the second research cycle was implemented as a result of the reflection phase following the first research cycle. The use of offline SLS as opposed to live SLS via respeaking prevented too extensive an editing of the lecture content, eliminated the issue of the delay and allowed for a reading speed that was manageable for the participants. The fact that the students viewed a recording of the lecture afterwards also encouraged the participants to focus on the SLS and not to split their attention between the lecturer and the SLS (in the context of the respoken SLS). However, the outcome still did not entirely confirm the hypothesis. Indeed, the statistical analysis of the relevant data showed that the SLS had a positive impact on receptive academic literacy ability, but no impact on subject-specific comprehension. The main reason for this was thought to be the fact that the SLS were competing with the PowerPoint slides the lecturer used during classes.

The third research cycle was therefore designed and implemented in order to eliminate this constraint, which proved successful. Indeed, the test group performed significantly better than the control group in the semester test, which confirmed the hypothesis that SLS would help improve the students' subject-specific comprehension. However, another important factor in this cycle was the fact that only the test results of the participants who had attended the practical revision classes on a regular basis (at least four out of the five sessions) were taken into account in the context of the statistical analysis. It therefore seems as though the revision of academic content by means of this mode led to improved performance as far as the test group is concerned, an effect that could in part be ascribed to the presence of subtitles.

It can therefore be concluded that the optimal setup for SLS to help improve the subject-specific comprehension and the receptive academic literacy skills of EAL students is based on the following parameters: the subtitles should be prepared offline and shown to the students in the context of practical revision classes. The regular lectures should preferably not involve any slides, as these compete with

the SLS. It is also important that the students be exposed to these practical revision classes for a longer period of time to allow them to become familiar with the mode, and that their attendance be monitored. Indeed, this study showed that the exposure to SLS during lectures benefits the subject-specific, long-term comprehension of students as opposed to shorter-term comprehension.

6.5 Avenues for further research

The issue of low levels of English academic literacy and reading skills in South Africa is a major concern in tertiary education, as it prevents the students from coping with the demands of the tertiary academic environment (Coetzee-van Rooy & Verhoef, 2000; Butler & Van Dyk, 2004; Foley, 2004; Weideman, 2004). The present study highlighted the potential of SLS as an aid to improve receptive AL ability and subject-specific comprehension. Therefore, the potential of SLS as a learning aid should be the object of further research, based on the results of this research.

The following avenues for further research are therefore suggested:

1. Firstly, it may be useful to repeat the present study. In addition to the specific conditions described in the previous section, it is suggested that the practical revision classes be made compulsory, as a key aspect of the intervention's success is the regularity of the exposure to the SLS. It may also be appropriate for the intervention to be carried out over a whole academic year, to give the students ample time to get used to the mode and thus reap the full benefits. Such a project has already been approved in principle on the Vaal Triangle Campus of North-West University, where this study took place.
2. In the context of his study evaluating the use of captioned videos in foreign language classes, Garza (1991:246) suggests that further research be conducted using other types of SLS, such as verbatim,

- paraphrase and keywords. Verbatim SLS, whether produced live or offline, may be difficult to achieve, due to the constraints inherent in both methods of production. However, the use of SLS paraphrasing the content of the lecture or displaying only keywords may be worth investigating.
3. Another avenue that has to be explored is the isolation of the factors that contribute to improvement in receptive academic literacy abilities and subject-specific comprehension. This could be achieved, as a first step, by introducing a control group watching the videos without subtitles to control for the variable of repetition or revision. Such isolation of elements could further be achieved by designing and administering dedicated tests to measure specific components of the listening and reading abilities of students, which would require a highly controlled experimental setup.
 4. Finally, it would be useful to compare the impact of textual support in the form of slides to the impact of textual support in the form of subtitles, in terms of subject-specific comprehension. This issue is raised based on the conclusion that was made in the second research cycle of this study, which stated that the presence of slides during classes interfered with the SLS. This could be achieved by comparing the subject-specific performance of a group that received textual support in the form of slides to the performance of a group that received textual support in the form of SLS, in the same academic subject.

6.6 Recommendations

As a result of the findings of this study showing that the introduction of SLS as a learning aid leads to an improvement in students' receptive academic literacy ability as well as subject-specific comprehension (if the conditions described in the study are met), it is recommended that tertiary institutions in South Africa consider the possibility of making subtitled videos of lectures part of, for instance, practical revision sessions.

However, one important concern remains, which relates to the promotion of Black South African languages as means of learning and teaching, as highlighted by a variety of governmental sources and scholars (Language Policy for Higher Education, 1997; Alexander, 2000; Heugh, 2000; Barry, 2002; Brand, 2004). Measures must be taken to promote indigenous languages as languages of learning and teaching and to “prevent proficiency in English from becoming further established as a marker of opportunity and privilege” (Brand, 2004:4-5). It may therefore be argued that the use of English subtitles as a learning aid in the university classroom (as opposed to subtitles in the relevant indigenous language) would further entrench the notion that English is the language of academic, social and economic success in South Africa and that “whoever wishes to improve their lot, and that of their communities, by becoming educated, entering the job market, and striving for leadership positions, should first acquire English” (Brand, 2004:4-5). However, although this is a valid concern, it cannot be ignored that, at this point in time, English (and Afrikaans, although to a lesser extent) is the only fully functional language of learning and teaching at higher education level (Foley, 2004:57).

It is therefore hoped that an intervention such as the one described in this thesis will not be perceived as an obstacle to the promotion of Black South African languages as languages of teaching and learning by the relevant authorities. An attempt at reconciling the two could actually lead to further research on how translated subtitles (or interlingual subtitles) could be used in order to facilitate the promotion of these languages in a tertiary education context.

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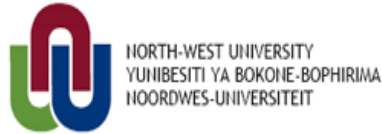
ADDENDA

ADDENDUM A: Definition of the terms underlined in Romero-Fresco's definition of respeaking (2011:10)

- **“Live:** respeaking is also being used nowadays for pre-recorded subtitling, due to the fast throughput it produces.
- **Programme:** see “subtitles” below.
- **Respeak:** depending on the case, this verb could mean to repeat, to rephrase or even to translate from one language to another. To start with, respeaking is mostly carried out intralingually. Respeakers are often encouraged to repeat the original soundtrack so as to produce verbatim subtitles. Yet, the high speech rate of the source text often makes it impossible for respeakers to follow the original soundtrack literally. This means they have to edit it, thus rephrasing it rather than repeating it. Finally, respeakers in Red Bee Media Wales or VTM (Flanders), to name but two examples, respeak interlingually from Welsh and Flemish into English.
- **Features for the deaf and hard of hearing audience:** the amount of extra information provided for deaf and hard of hearing viewers depends on many factors such as the channel, the programme, the respeaker, the time available, etc. Most respeakers introduce information to identify the different speakers and sometimes other extralinguistic elements such as clapping, booing or laughing.
- **Speech recognition software:** respeaking usually involves two types of software. Firstly, there is a speech recognition (SR) application that recognizes the respeaker's utterances and can display them, for example, on an ordinary text application such as Microsoft Word. Then, this speech recognizer is integrated into a subtitling application that shows the recognized utterances as subtitles on the screen.

- **Subtitles:** [...] respoking is not only used to subtitle programmes on TV but also to provide speech-to-text-based accessibility (real-time transcription) in live events held in different venues such as museums, theatres, conferences and even churches. In these cases, for example in a gallery talk, the screen may not display images, but only the respoken utterances, which are then not exactly subtitles.
- **Minimum delay:** the delay may vary greatly depending on a number of factors including the software, the correction method or the subtitling mode. The delay in Windows Speech Recognition (Vista) is longer than in Dragon or ViaVoice; the correction method used by the French broadcasters TF1 and France 2, involving two people, causes longer delay than in other channels where respokers correct their own mistakes; finally, when respoking is used for pre-recorded subtitling and thus not intended for a live audience, a longer delay is not a problem at all.” (Romero-Fresco, 2011:10)

ADDENDUM B: Consent form – first research cycle



CONSENT FORM

**RESPEAKING PILOT STUDY:
English same-language subtitles as an aid to comprehension.**

Researchers:

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Please initial box

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.
3. I agree to take part in the above study.

Please tick box

4. I agree to the use of anonymised quotes in publications.

Name of Participant

Date

Signature

Name of Researcher

Date

Signature

Name of Witness

Date

Signature

ADDENDUM C: Information sheet – first research cycle



Information sheet *Respeaking research study: same-language subtitles (SLS) as an aid to comprehension.*

You are being invited to take part in a research study. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully.

- The purpose of the study is to find out whether English same-language subtitles through respeaking (or the production of live subtitles through Speech Recognition software) during lectures can be used in order to improve the comprehension of students studying through English as an additional language (EAL). This data collected as a result of this pilot will help us determine whether same-language subtitles through respeaking indeed improve the comprehension of EAL students through the double exposure (aural and visual) and by overcoming the barrier presented by the fact that they are studying through an additional language.
- You are invited to participate on a voluntary basis as a student studying through English as a second language.
- For the purpose of this study, you are required to write a pre-test in English Academic Literacy: the TALL test. ECON 121 Group 2 will then be split into two sub-groups. The group distribution is now available on Efundi. One group (the experimental group) will attend the classes with English subtitles, and the other group (the control group) will attend classes without subtitles. However, the recorded lectures and subtitles will be made available to all students before the start of the exams.
- *It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.* Your choice to either take part or not take part in the study will have no impact on any of your academic marks, assessments or future studies. You will however still be expected to attend class and complete evaluations as required. But your data will not be taken into account.
- There are no disadvantages or risks or costs involved in your participation.
- The study will benefit research in the field of respeaking as well as in academic support for students studying through English as a second language.
- All information collected about you as individual will be kept strictly confidential (subject to legal limitations) and confidentiality, privacy and anonymity will be ensured in the collection, storage and publication of research material. The data generated in the course of the research must be kept securely in paper or electronic form for a period of five years after the completion of a research project and will be anonymised for the purposes of reporting.
- The results of the research will be used as basis for academic publications and conference papers. In the long term it will also have an impact on the way lectures presented in English can be made more accessible for students studying through English as an additional language. You can contact Dr Kruger for a copy of the publications.
- A full version of this information sheet is available on Efundi. Please read it before Friday 6 August, which is when the respeaking will start. Consent forms will be handed out then for you to sign.

ADDENDUM D: Log of respoken lectures (first research cycle)

Log of respoken lectures

Session 1: Friday 6 August, 12:30-13:50 (Chapter 9)

Camera: Fanny

Respeakers: Christo and Deidré

During this session it was discovered that the acoustics of the storeroom in which the respeakers sit is problematic. The echo seemed to confuse the speech recognition software. As a result, the performance of the latter was less than adequate, which caused many mistakes to appear in the subtitles. The respeakers reported having to type rather than respeak in order to correct as many mistakes as possible and to keep up with the lecturer.

It was also reported that one of the two Dragon voice profiles is not performing well: the recognition takes very long (the text sometimes fails to appear) and the recognition is quite poor. It is possible that this voice model requires more training.

While observing the class, I noticed that some of the students' eyes moved from the lecturer to the live subtitles once the lecturer had finished an utterance. It could be that the students first listen to the lecturer, then look at the subtitles, possibly to check for comprehension. It is however difficult to say whether it is indeed the case, or whether the students may simply be intrigued by the novelty of the method, or else attracted by the video. At this stage, I'd like to suggest that interview be set up with some of the students at a later stage, to gather more information regarding their attitude towards the mode. Less than half of the total number of students supposed to attend class in this group (120) was present.

NB: Potential mistakes in the subtitles are corrected live, which means that the corrected version is all that is available in order to work out the percentage of accuracy. However, it is mostly impossible to correct all mistakes, and it is assumed that some mistakes will remain in the transcript.

Session 2: Friday 13 August, 12:30-13:50 (Chapter 10)

Camera: Sonje du Toit

Respeaker: Fanny (Christo and Deidré unable to attend)

The echo in the storeroom caused further problems. Although the software had been trained according to the content of the lecture, the recognition was very poor to start off with. As the respeaker, I had to do a lot of typing in order to correct mistakes, create understandable subtitles and keep up with the lecturer's pace. Keeping up was problematic, as I had to work without a buddy. Fortunately, the lecture was shorter this time (45 minutes approx. instead of 1h30), which made things easier for me. However, it can be said that once again, the quality of the subtitles may have been less than adequate. I asked the lecturer whether she had noticed that the students are actually looking at the subtitles. She reported that, from her perspective, the students' eye movement indicates that they are indeed "sharing" eye contact between herself and the subtitles.

Practice session: Thursday 12 August, 9:00-11:00 (Samancor's storeroom)

Christo and Fanny

It was decided that Dragon should be regularly trained in Samancor's storeroom so that the software can get used to the acoustics. During this practice session, we found out that the effects of the echo can be overcome to some extent by respeaking in as low a voice as possible. The louder the respeakers, the more disturbing the echo is to the speech recognition.

The time was spent practicing from the previous video recording (13 Aug.) and training the software according to the content of the next day's lecture.

Session 3: Friday 20 August, 12:30-13:50 (Chapter 11)

The session did not take place, as Samancor had been booked until 16:00 for another event, without our knowledge, despite the fact that the venue had been formally booked for our purposes. No filming and no respeaking were done.

Session 4: Friday 27 August, 12:30-13:50

Class cancelled.

Session 5: Friday 3 September, 12:30-13:50 (Chapters 12 & 13)

The respeaking could not take place, due to a technical issue. However, it was possible to film the lecture. I subsequently created off-line subtitles via respeaking for this video recording using Dragon 10 as usual. Less than half of the total number of students supposed to attend class in this group (120) was present.

Session 6: Friday 10 September, 12:30-13:50 (Chapter 18)

Camera: Sonje du Toit

Respeakers: Fanny and Christo

Classroom observation: Deidré

The session started with serious technical problems: for some reason, we couldn't project from the laptop, and had to fiddle with cables for some time. Eventually, the problem was solved, but the lecturer had already been going on for 15 minutes before we were able to start respeaking. The notes I had made based on Chapter 18 were useful, as I could read from them when unable to keep up with the lecturer. While the projection issue was being dealt with, we also noticed that we couldn't get any recognition with the usual USB microphone. The reason for this is that Christo and myself have had to train Dragon with a different headset with a line-in microphone while Deidré was using the USB headset. We eventually plugged in the line-in microphone and actually obtained better recognition than with the USB headset. It was therefore decided that the line-in microphone would be used for the purpose of training the software.

Classroom observations by Deidré: "On the whole I could see that the students were looking at the screen. At the beginning of the class, while you were struggling to get everything up and going, the students seemed to be particularly attracted to the movements on-screen. Once things were all set up, the students still glanced/stared at the screen from time to time. However, the majority did not seem to be reading (I could be wrong here, but in general many of the students seemed to be bored with the class and looked as if they were not paying any attention). Still, from time to time there were

students that I could see were actually reading the subtitles. I also noticed that at the times that the lecturer uses the blackboard, the students seem less inclined to look at the screen.”

Session 7: Friday 17 September, 12:30-13:50 (Chapters 18 & 19)

Camera: Sonje du Toit

Respeakers: Fanny and Christo

Classroom observation: Deidré

This respeaking session went rather smoothly, but for two problems: first, the lapel microphone was unexpectedly out of order and the technician did not manage to fix it. A hand-held microphone is also available, but the lecturer preferred not to use it, because she needed to write on the whiteboard. The sound quality was therefore not adequate, to the extent that in some occasions, we absolutely couldn't hear what the lecturer was saying, which made respeaking impossible. In two instances, I started respeaking an utterance and was unable to complete it because the rest wasn't audible. There were therefore two incomplete sentences among the live subtitles. Second, for some unknown reason, we couldn't get the live video input to play in VLC Media Player. Therefore, only the subtitles were projected, the students did not have access to the video.

Classroom observations by Deidré: “The students did look at the screen from time to time. The majority of students did not seem to read the subtitles, but only gave the screen a passing glance. However, there were those who I could see were reading (or just staring at the video feedback on screen) for longer periods of time. One student in particular was looking at the screen at a time that the lecturer asked a question, and nodded in response to the question without breaking eye contact with the screen, but I think he was mainly looking at the video (this was one of the students that I noticed looked at the screen most often).”

Session 8: Friday 8 October, 12:30-13:50 (Chapters 20, 21 & 22)

Camera: Sonje du Toit

Respeakers: Deidré and Fanny

No classroom observation.

The first few minutes of the lecture were not respoken due to a sound problem. The rest of the session went rather smoothly.

Session 9: Friday 15 October, 12:30-13:50

Class cancelled

Session 10: Friday 22 October, 12:30-13:50

Revision class (45 min).

No respeaking possible due to the fact that both the experimental and the control groups had to attend the same class.

Students involved in the study wrote the post-TALL test.

ADDENDUM E: Example of corrected aligned file (First lecture, 6 August 2010), including comments made by the ECON 121 lecturer

Using footnotes, the lecturer and the researcher made comments regarding the quality of the live subtitles produced via respeaking during this specific session.

Raw transcript	Near-verbatim transcript
	Calculations is what this semester is based on. If you cannot do them, ask me. Particularly those of you that have a problem with mathematics. Ask me. Or take your problems to your maths lecturers, for example.
Today we start with elasticity. There are two very important calculations. We will carry on in a minute. ^{8 9}	
The full description of the study is on efundi. The test of the study is not for your participation mark. It is confidential. ^{10 11}	

⁸ Unnecessary comment (Lecturer's comment).

⁹ Unnecessary comments do not represent edition errors, as long as they do not introduce information that wasn't present in the original text to start off with (comment made by the researcher, in response to the lecturer's observation).

¹⁰ I honestly cannot decipher this statement ??? (Lecturer's comment).

¹¹ This comment refers to the study. Technically, it shouldn't have been respoken, as it did not directly pertain to the content of the lecture (Researcher's comment, in response to the above observation made by the lecturer).

<p>Elasticity and Claudia bemoaned¹²</p> <p>Elasticity takes supply and demand further. Elasticity tests the sensitivity of two variables. Very important: Only the sensitivity of two variables taken into account for basic elasticity. If you still don't understand earlier chapters, go back.¹³</p>	<p>First off, we start with a basic definition of elasticity. Now, elasticity essentially tests the sensitivity of two or more variables. You'll see, beginning of chapter 9, it'll start with a basic definition of elasticity and then it'll have the definition of elasticity of demand. I want you to be very very careful: they are two very different things. Basic elasticity takes into account only the sensitivity of two different variables. Elasticity of demand takes that a step further and sets the responsiveness or sensitivity of demand to a change in price. You see now why I keep saying, when we did chapters 7 and 8, why this is so important. We are going to be using demand and supply for the next few chapters. If you still don't understand chapters 7 and 8, please go over them.</p>
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¹² Serious misrecognition error on the part of the speech recognition software (Researcher's comment).

¹³ Elasticity of demand should have been mentioned here as it is the basis of the chapter (Lecturer's comment).

<p>There are five types of elasticity of demand.</p> <p>Elasticity of supply is very similar, we only deal with supply for one and demand for the other.¹⁴</p> <p>Elasticity of demand measures percentage change in demand after a change of 1% in price.</p> <p>pp. 159, 160, 162 important.</p>	<p>Elasticity of demand deals with the change in the quantity demanded as a result of a 1% change in price, and what the difference is. Now, before we actually get to actually calculating elasticity...There are five different types of elasticity of demand. There is different types of elasticity calculations, however there is five different types of elasticity of demand and if you have already gone through the chapter, you will notice that elasticity of supply is only one or two pages. Everything that applies to elasticity of demand applies to elasticity of supply. The only difference: on one hand, you are dealing with demand, on the other with supply.</p> <p>On page 159. Elasticity of demand, as I've said, measures the percentage change in quantity demanded as a result of a 1% change in the price of the product. From chapters 7 and 8, you should know by now, that if the price increases or decreases, you are either going to buy less or more...depending on whether it is a price increase or a decrease, whether it is a substitute or a complementary product...these are the factors we need to take into account.</p> <p>Now, with the different types of elasticity of demand...The definitions are on 159, there is discussions on 160 and 162, but for now I want you to have a look at the graphs on 161.</p>
<p>Perfectly elastic and perfectly inelastic demand: elasticity of demand is similar to physical inelasticity. If a product has high elasticity of demand then the change in price leads to a large change in demand.¹⁵</p>	<p>I am going to be doing the two extreme cases first: Perfectly inelastic demand and perfectly elastic demand. Now...Easiest example to remember elasticity: this is a pen. Can you stretch it at all? It's inelastic. No change can occur to the length of this pen. A rubber band or a hairband can just keep on stretching. It's elastic, in other words. The same will apply to demand and changes in the price. Depending on the actual product, if it is inelastic, if there is any change in price, there is not going to be any change in the quantity of demand, or the quantity of that product demanded. Just as a pen, you can't stretch it out at all. With the elastic band, obviously, it is exactly the opposite. If there is a change in the price, there is going to be a definite change in the quantity demanded.</p>

¹⁴ It should be clearly indicated that elasticity of demand covers demand aspects while elasticity of supply covers supply aspects. This statement can be misinterpreted as it is rather vague (Lecturer's comment).

¹⁵ The change in demand that occurs as a result of the change in price can be large or small. It's incorrect to state that the initial change is large unless defining perfect elasticity (Lecturer's comment).

<p>Figure A. and E. on page 161 illustrate perfectly elastic and perfectly inelastic demand.¹⁶</p> <p>Perfectly inelastic demand means that you demand a certain quantity irrespective of price. Salt is an example.</p> <p>Perfectly elastic demand: the exact opposite of perfectly inelastic demand.</p> <p>If there is even a small increase in price, the quantity demanded falls to zero.</p>	<p>Now, I said I am going to be dealing with the two extreme cases. That is figure A and E on page 161. These two situations are known as perfectly inelastic demand, with graph A, and perfectly elastic demand with graph E. Now right away, if you have a look at graph A, you will notice that that curve is on the quantity axis only.</p> <p>With perfectly inelastic demand, you are going to be at that quantity regardless of the price change. Let's think of a certain product. Who can give me an example of a household product that you use, where this situation applies? You are going to buy the same quantity, regardless of the change in price. I can guarantee you it will be a product you won't ever think of. But try. Who knows the exact price of a bag of salt? You buy salt, don't you? Salt is one of those odd products, that regardless of the price, you're going to buy the same quantity. Just because the price of salt decreases by 5 cents, are you going to go out and buy three extra bags of salt? If it becomes more expensive, I can guarantee you it will only change by a few cents, so will you even notice the price change? Most likely not.</p> <p>What can you tell me about figure E? It's the exact opposite of A, so.... Regardless of the equilibrium quantity, you are still going to buy that quantity at a certain price. Interestingly enough, with perfectly elastic demand, if there is a slightest change in price, the quantity demanded will fall to zero. That is unlike situation A, the perfectly inelastic demand. If there is a slight change in price, if it is a perfectly elastic situation, there will be a complete drop in the quantity demanded. You are only accepting it at that price. The moment the supplier increases the price, demand will drop. Perfectly elastic, perfectly inelastic. Inelastic: no change if there is a change in price. No change in the quantity demanded. Perfectly elastic: there will be the greatest change in quantity demanded if there is a change in price.</p>
<p>With inelastic demand, you have a percentage change in quantity demanded that these is smaller than the percentage change in price. If someone for example pays attention to the</p>	<p>Then we have the next two situations: elastic demand and inelastic demand. Somewhat like the two extreme cases, with perfectly elastic and perfectly inelastic. However, I want you to take note, with inelastic demand, that change in demand is less than the change in price. That</p>

¹⁶ It should be mentioned that the curve lies on the quantity axis only (Lecturer's comment).

<p>price of salt, they will not change their consumption as much.</p> <p>Elastic demand: the percentage change in quantity demanded is greater than the percentage change in price.</p>	<p>percentage change in the quantity demanded is less than the percentage change in price. Remember the definition of elasticity of demand is the sensitivity or the change in quantity demanded caused by a 1% change in the price of the product. With inelastic demand, that percentage change is less than the percentage change in price. So if we have a 1% change in price, the percentage change in demand will be less than 1%. So if we have a situation where some people do actually take note of the price of salt, if the price increases, you may have one or two consumers that stop purchasing that particular brand, or stop purchasing salt. Elastic demand is also once again the reverse. The quantity demanded, or the percentage change in quantity demanded, is much greater, or is just greater, than the percentage change in price. Let's go back to the definition again. Elasticity of demand is the percentage change in quantity demanded as a result of a 1% change in price. So if we have to take into account that there is only 1% change, demand, or quantity demanded in this case, will change by 2 or 3%.</p>
<p>You must know perfectly elastic and inelastic, as well as inelastic and elastic.</p>	<p>You have to know the two extreme situations; you have to know elastic and inelastic.</p>
<p>Unit elasticity: percentage change in demand equal to percentage change in price.</p>	<p>And because this is economics, and we always like to give you many many options, the mid-range between all of these is called unitary elastic demand. Unitary elastic demand...where the percentage change in quantity demanded is going to be exactly equal to the percentage change in price.</p> <p>We go back to the definition once again. Measures, change in percentage in quantity demanded to a 1% change in price. In the case of unitary elastic demand, demand is going to change by 1% if price changes by 1%. So, so far, you need to know the basic definition of elasticity. I will ask you: describe or define elasticity. And I will ask you to define elasticity of demand or elasticity of supply.</p>
<p>Know: definitions for the elasticity of demand, perfectly elastic and inelastic, as well as elastic and inelastic.¹⁷</p>	<p>All of these different types that we have gone through: perfectly elastic, perfectly inelastic, elastic, inelastic and unitary elastic demand...all of these types also fit supply. It is not in your textbook but I can ask you this. It is not set out as nicely as what it is with demand.</p>

¹⁷ It should be mentioned that the definition also apply to supply with the only difference being that supply will change as a result of a change in the price of inputs to the production process (Lecturer's comment).

	<p>Exactly the same, except with demand, where it says demand, replace with supply, where it says supply, replace with demand. So if there is a very great change in the actual price that the supplier supplies a product, there is going to be a definite change in the quantity supplied. Alright. Exactly the same factors with it, don't come and ask me with the test, it is there, it just isn't set as nice and pretty as it is with demand.</p>
<p>Go back to page 155. You will use 2 measures of elasticity. Pointed elasticity is the first measure. The calculation measures elasticity at a certain point.</p> <p>Write down the equation.¹⁸ ¹⁹ Q1 refers to quantity one and P1 refers to price one.</p>	<p>Now, I want you to go back to page 155. And I also want you to take note of box 9.1 on page 159. Now, there are two measurements of elasticity that you are going to be dealing with. The first is point elasticity.</p> <p>Now, if you have the demand curve, as what you are used to: alright, quantity, price and here you have point A and point B. You want to measure the sensitivity of this change.... You want to measure the sensitivity of the quantity demanded at these two price levels. Remember, we are taking it a step further. We want to see what are the conditions at point A and what are the conditions at point B. In order to do this, you can either use point or arc elasticity. Depending on the question, please.</p> <p>Now, with point elasticity... Before we even get to that part of the equation, I want you to first have a look at this part. Please write down this equation. Very very important. It's much easier than what the textbook shows you and what the study guide shows you. The second part of the equation... Remember we are dealing with point elasticity. So I can ask you: calculate elasticity at point A. A is our point 1. B is our point 2. So I can ask you: calculate elasticity at point A. Then, this is the equation. If I ask you to calculate elasticity at point 2...this isn't division, this is "over". Please just take that into account. So, let's rather start the equation from the beginning.</p>
<p>If I want you to calculate elasticity at a particular point, why are you using the other point? Elasticity is measured along the slope of the demand curve. You need a second point for reference. Take note of the equations on the</p>	<p>You want, or I want you to calculate elasticity at point 1, but if you have a look at the equation, why are you taking point 1 and point 2 into account?</p> <p>Remember, elasticity is measured along the slope of the demand curve. A and B is points on the demand curve which corresponds to the</p>

¹⁸ The equation should be given (Lecturer's comment).

¹⁹ It was decided not to include the equation in the SLS for two reasons: firstly, equations are very difficult to respeak; secondly, the equation was available on the whiteboard, so the students could actually see it (Researcher's comment, in response to the lecturer's).

<p>board. You must practice these calculations. This is the easier equation. What happens when we want to know elasticity between two points? The beginning of the equation looks the same as four elasticity. But instead of taking the price and quantity of 1 point we take both points into account for the second half. We must calculate elasticity between two points using an average of two elasticity is. For arc elasticity, you were between two points. Arc elasticity calculates the average rate of inflation between two points on a curve.</p>	<p>actual slope calculation. If you don't know what a slope is, chapter 6. Even though we are not calculating the elasticity for point 2, you still require point 2 to give you some form of reference. With point elasticity, always have as look at the two points that we have given you. Any questions?</p> <p>In your study guide, there are excellent examples you can go through. It starts on page 17 of your study guide and it goes on...all the way up to page 20. I suggest you get to know this equation. This is the easy equation.</p> <p>Now, we are looking at a specific point, either A or B. But what happens if we want to know elasticity between these two points? If you have a look at box 9.1 on page 159, I believe, you'll see this little diagramme with an equation next to it. This is the equation for arc elasticity. This looks exactly like point elasticity, in the beginning. Yes? Starting exactly the same as point elasticity. Now, however, if you look at the second part of the equation, instead of just taking the quantity and the price of one specific point, we are now taking both points into account. And, notice, we are adding Q1 and Q2 and we are adding P1 and P2. Why?</p> <p>Remember, we are trying to calculate...with arc elasticity, we are trying to calculate elasticity between point A and point B. So in other words, we are attempting to get a what between these two points? An average between these two points. We are calculating elasticity from A all the way through until B. Remember, as your demand curves shifts from one point to the next, in effect, while moving by certain fractions, from one whole number to the next whole number, the movements in-between are smaller fractions. Arc elasticity measures all the tinier fractions of movement from one point to the next. With arc elasticity, you are taking both points into account. Point elasticity, it depends on what I am asking you. Arc elasticity, I will be asking between two different points.</p>
<p>You must be able to discuss the five types of elasticity of demand and supply as well as point elasticity and arc elasticity.</p>	<p>Your first two calculations this semester: you need to be able to calculate point and arc elasticity. Graphs, I can ask you to draw and discuss those five types of elasticity of demand, or elasticity of supply: perfectly elastic, perfectly inelastic, elastic, inelastic and unitary elastic. Definition questions, short questions, it's all important.</p>
<p>On page 163 two 165: the determinants of</p>	<p>Now, a very important discussion question. - It</p>

<p>price elasticity of demand. Substitutes: if a product has substitutes, demand is more elastic. If a product has no substitutes, demand is less elastic. For example, butter has a substitute in the form of margarine. If the price of butter increases consumers will find an alternative product, in this case, margarine. This causes demand for margarine to decrease on one hand, while the demand for butter will decrease on the other. Therefore, the price is elastic.²⁰</p>	<p>starts on page 163 and carries on to 165 - is the determinants of price elasticity of demand. So, as with chapter 7, we had the determinants of demand and the determinants of supply, we now also have the determinants of elasticity of demand. Now...if you have a look at them, the very first determinant is substitutes. According to chapter 7, with demand, what happens to the quantity demanded with substitute products? What does that mean for elasticity? If there are no substitutes for a product, if there is a change in price, can you buy another product to replace it? If there's no substitute...obviously, no! You cannot replace that specific product. Relatively inelastic, if that is the case. If there are substitutes...let's use butter and margarine. The demand for either is elastic. They are substitutes for each other. You should know this, I have used the example in chapter 7 and in chapter 8. If there is an increase in the price of butter, what is going to happen to the quantity demanded of butter? Decrease...which tells, if there is change a change in price, there is an immediate change in the quantity demanded...elastic or inelastic? Elastic. Because of that increase in the price of butter, there is an increase in the quantity demanded for margarine, regardless of the price. We all know that it is usually at a much lower level than butter anyway. The reverse can also occur. If there is an increase in the price of margarine, which puts it at either the same level or above the price of butter, there is going to be what change in demand? Rather quantity than change in demand, isn't that right? So, elastic or inelastic? With substitutes, the demand condition between the two products is elastic. Because of the change in price in one, we can go and purchase product B. If there is a change in price in product B, we just go and purchase product A. Substitutes are elastic.</p>
<p>Complementarity: if the degree of complementarity between the two products is high, the elasticity is high.</p>	<p>Your next point: what about complementary products? If you recall, from chapter 7 and 8, I mentioned a certain term: degree of complementarity and it is a very important term that you have to know now. The degree of complementarity. I used two examples, if you recall, I said: some of you make a cup of coffee, so you need coffee, water, mug...however, some of you like sugar, milk,</p>

²⁰ To clarify this statement the reason for price elasticity should be stated (Lecturer's comment).

	<p>maybe not milk, maybe the creamer, but if the price of coffee increases, is that going to cause any significant change in the quantity demanded of sugar? No, because sugar can be used in the production of other products. What happens if there is an increase in the price of vehicles? What about the tyres? Demand is going to decrease, because not everybody can afford a new car, so you won't necessarily need new tyres. The degree of complementarity is much higher in the case of cars and tyres than what it is in the case of coffee and sugar. The degree of complementarity is much lower. So, given those two examples that I have used, if you recall, if there is an increase in the price of coffee, will there be any change in the price of sugar demanded? Yes or no? That's a no. So that means, elastic or inelastic? Inelastic. There's no change, think of the pen. Between vehicles and tyres, an increase in the price of one will cause a decrease in the demand of the other. Elastic or inelastic? Elastic. Depending on the degree of complementarity.</p>
<p>Please make sure that you understand the calculations.</p>	
<p>The type of want: if one can only afford a certain number of goods, one will purchase the essential goods. Therefore, luxury goods have higher elasticity of demand than essential goods.</p> <p>The proportion of income spent: what will you be looking at?²¹ The elasticity will depend on the type of product purchased. If the product is a luxury item and more income is used to purchase the product, any change in price would cause a definite change in demand. If the product is an essential item, a change in price would not alter demand. Consumers may look for substitutes but demand will still be present.</p>	<p>Your next point: the type of want that is satisfied. And here I want you to take notes of luxury goods and essential goods. Now, if you are purchasing...let's say, for example, you are shopping at the end of the month, you are purchasing a loaf of bread and a slab of chocolate. You only have enough money for one of the two products. In this example, let's just use the broader definition: chocolate is a luxury. A loaf of bread, however, is the essential product. So if you can only afford one or the other product, which one are you going to purchase? Bread. Now, given that option...what do you think is going to occur between luxury goods and essential goods if the price happens to change? Which one is elastic, which one is inelastic and why?</p> <p>In the case of your luxury goods, it is going to be elastic. You don't essentially need them. You do need the essential foodstuffs. So you are going to purchase that product. With the essentials...once again, think of the pen. Inelastic. Change in price, you still need to purchase that product. With the luxury goods, elastic, any change in price, definite change in the quantity demanded.</p>

²¹ Explanation is required (Lecturer's comment).

	<p>Your next point is your level of income. We'll get to the time period now. Your next point is the amount of income that you are actually spending on these items. Now...if you are only earning R500 a month, you are perhaps going to be spending R400 on groceries - the products you need, in other words, that includes - basic hygiene products, basic foodstuffs, transport, etc. – R400 on that, the essentials. And a R100 you have budgeted for luxuries. Now, if the price of foodstuffs increase (the necessities) and instead of spending R400 you are now spending R450 and instead of R100 for luxuries, you are now spending R150...which one are you going to decrease your expenditure on? The luxuries. The amount that you spend the least on. If the greatest proportion of your income is spent on certain items, those are usually the essential products that you are going to be needing, regardless of the price. What will you be looking at, however? Substitutes, to try and decrease that expenditure.</p>
<p>The time period applies to producers. If the product is one of your main inputs to the production process you will attempt to find the item at various suppliers and will most likely purchase the product regardless of price. You will look at different suppliers, no matter what the price, because you need the product. If you cannot wait for an input, it is inelastic. If you're willing to wait for the product, then demand will be elastic as you would rather purchase the cheaper product, even though delivery time has been increased.</p>	<p>With the time period, it doesn't always apply – and this is on page 164, right-hand column 1 – with the time period, it does not always apply to all consumers. The time period more applies to producers, when they become consumers and purchase inputs in order to produce a final product. If you need a certain input right away, regardless of how much it costs, you are making a car, for example, regardless of how much it costs, you need ...those car seats, because without them, you do not have a finished product, you don't have a finished car. So you can't sell that item. So you will look at different suppliers and you will get those car seats, no matter what the price, because you need to finish that vehicle in order to earn the income necessary. So if you need that product urgently, you are going to pay whatever price for that product. However, if you are only expected to finish that vehicle in 4 months' time, and your supplier will most likely deliver in 2 months, your cheapest supplier, would you be willing to wait? Yes. The cheapest supplier will deliver within that time span, you are willing to wait, you can manufacture the other cars up until that point and when they deliver, you can just put in the car seats. And there you, finished product. If you absolutely cannot wait for a certain input, elastic or inelastic? Remember, we have said, you are going to purchase that product regardless of the price. Elastic or inelastic? Inelastic. If you are willing to wait for</p>

	that product, elastic or inelastic? Elastic.
	Now, I want you to completely disregard p.166.
<p>The other determinants of elasticity of demand are not important. I will not mark them!</p> <p>On p.167 it goes through other types of elasticity. You need not calculate these, only know the definitions.</p>	<p>Now, on page 167...so you go from 165 to 167. So, on page 167, you go through other types of elasticities. You will not have to calculate these elasticities, you only need to know the definitions. Write this down, you will not need to calculate, you only need to know the definitions, either for short questions or definition purposes. And also you need to know the examples, we'll get to those. So, the very first, that is on page 167, is income elasticity of demand. Who wants to take a guess? What is income elasticity of demand? Take a guess.</p>
<p>Indeed not be able to calculate income elasticity.²² Income elasticity of demand measures the responsiveness of demand to changes in income earned.</p>	<p>Income elasticity of demand is going to test the responsiveness of the quantities purchased or the quantities demanded relative to your income. So in other words, you go from earning R500 a month to earning R50000 a month. How much are you going to demand? A lot more. But as responsible students, you will invest quite a large portion and then you can spend the rest. Remember, saving the economy starts with those that are soon going to be earning an income. If you don't start saving, the future is bleak for the South African economy. So, income elasticity of demand, only the definition, you will not need to know how to calculate.</p>
<p>You will have to know how income elasticity of demand is altered when the product purchased is an inferior, luxury or essential product. You will however, need to know about normal products, inferior products, luxury products essential products. Think of butter and margarine. Margarine, in this case, is the inferior product. If income increases you would purchase the higher quality product. Therefore, as income increase, the demand for the inferior product, margarine will decrease as the demand for the higher quality product, butter,</p>	<p>You will however need to know what will happen with income elasticity of demand across the four different types of products: a normal product and an inferior product – this is all nicely bolded on page 168 --, a normal product, and an inferior product. A normal product is then further subdivided into an essential item and a luxury item. So you have normal products, inferior products. I'll give you examples now. Normal and inferior. Normal goes further into luxury and essential. Now, a normal product is those that we purchase all the time. An inferior product are those goods that obviously aren't as of superior quality as normal products but we have no choice but purchase them anyway. Think of butter and margarine, once again, our old example. Butter is the better quality product. Margarine, however, is the inferior equivalent. If your</p>

²² Income elasticity of demand should have been defined here (Lecturer's comment).

<p>will increase. If you have more money, you will buy butter. Now is the income elasticity of demand for butter and margarine positive or negative?</p>	<p>income increases, which one are you going to purchase? Because you can afford the better quality product. So, between normal goods and inferior goods, which one is elastic, which one is inelastic? And in the case of income elasticity of demand, we refer to it as a positive or negative income elasticity. Which one? It differs slightly from elastic and inelastic. Have a think for yourself. In the case of normal products and inferior products, which is going to have a positive income elasticity of demand, which is going to have a negative?</p>
<p>When income increases, the demand for a normal good increases (butter). We income increases, the demand for a the inferior good decreases (margarine).</p>	<p>And to add to that, not only do we buy them frequently, but as income increases, so does the quantity of normal products purchased. So in other words, there is a positive relationship between the two: income increases, quantity demanded...increases or decreases? Increases, likewise. With inferior products: if your income increases, you are going to buy less margarine. So in other words, an inverted relationship between income and inferior products. As income increases, less inferior products are going to be purchased. Now, we have normal and we have inferior. If you recall, normal is split up further into luxury and essential. Luxury goods: positive or negative? Why? As I mentioned, if your income increases from R5000 to R50000, you can certainly start buying a lot more chocolate than what you were, because you can afford luxury items. So is it going to be a positive or negative relationship? Positive. With essential products? This is where it gets tricky. You cannot essentially say that you will purchase less essential products. You still need basic foodstuffs. The difference is the actual quantity change.</p>
<p>When it comes to essential goods and luxury goods, on page 168, is that luxury goods have an income elasticity of demand greater than one. Essential goods have an income elasticity of demand less than one. Both still have a positive income elasticity of demand. Has your income increases, the percentage spent on essential goods decreases relative to the percentage change in income. However, you do not necessarily spend less.</p>	<p>I want you to have a look on page 168. Normal goods... when the elasticity of income, when the income elasticity of demand is greater than 1, in other words when the percentage change – this is all there, directly from the book, underline it, highlight it, very very important. When the percentage change in quantity demanded in greater than the percentage change in income, the good is a luxury. The reverse is true with essential products. If the percentage change in income elasticity of demand is less than 1, then it is an essential product. Both, however, interestingly enough, are still positive. You are still purchasing essential items and you are going to purchase</p>

	<p>luxury items. The key is – now we go all the way back to the basic definition of elasticity, just basic elasticity of demand – we are looking at the quantity of demand as a result of a 1% change in price. So if it is greater than 1%, or greater than 1, it is a luxury item. In other words, we are purchasing more of that luxury item than what we were previously. The proportion of income, as your income increases, the proportion of income spent on essential items starts decreasing. Even if you are earning R50000, you might still only purchase R400's worth of essential items. Just because you are earning more does not mean that you are going to buy 10 loaves of bread instead of the 5 that you use. Alright.</p>
<p>Low income households by a mostly certain can only afford essential goods. High income households do not necessarily buy more essential goods just because income has increased. Rich people do not necessarily bathe and shower more.²³</p>	<p>Think of the various income levels: lower, middle, upper end. Lower-income individuals have no choice but to purchase only a few essential items, because that's all they can purchase. Middle-income individuals is essential items but it's considerably more than lower-income individuals. Just because you are earning R50 000 to R100 000 a month doesn't necessarily mean that you will essentially purchase more essential items than your lower-income individuals. Silly example: Lower-income individuals...perhaps you are only earning R500 a month, so you can only afford perhaps two bars of soap, and even if it is two bars of soap, it's going to be exceptionally cheap bars of soap, because you still have to purchase food, transport, housing, etc, etc. So, if that is the case, just because you are now a rich individual doesn't mean that you are going to bathe or shower more regularly than lower-income individuals. Or brush your teeth more regularly than lower-income individuals. So essential items, the amount of expenditure on these essential items will stay a constant ratio. Not a constant, but a constant ratio.</p>
<p>On page 168: cross elasticity of demand. The demand for a product depends on the price of a related product. When it comes to substitutes: if the price of one product (butter) increases do we buy more of the substitute (margarine)? Yes.</p>	<p>The next that you have to know is cross-elasticity of demand. And this has to do with your complementary products and your substitute products. Now, this is on page 168. With cross-elasticity of demand, the quantity demanded is going to depend on the price of the related product. With substitutes: Positive or negative relationship? Why positive? According to cross-elasticity of demand, the</p>

²³ Unnecessary to include comment (Lecturer's comment).

	<p>definition, the quantity demanded of product A is going to depend on the price of product B. So butter and margarine...Let's call margarine product A, butter product B. The price of product B increases. Is there going to be a higher quantity demanded of product A? If the price of butter increases, are we going to buy more margarine? Yes. It's a positive relationship. A substitute exists, and depending on the price of butter, it's going to determine whether a greater number of consumers or smaller number of consumers purchase margarine.</p>
<p>Complementary goods: if the price of one product increases the demand for its complementary product would decrease</p>	<p>What about complementary products? A vehicle and tyres. Is that positive or negative? Negative.</p>
<p>you need to know all of these types of elasticity of demand. You need not know how to calculate all of them.</p>	<p>So you need to know both these additional types of elasticity of demand: income elasticity as well as cross-elasticity. You do not need to know how to calculate them but you do need to know what's going to happen to normal, inferior, luxury goods, essential items. And with cross-elasticity, your substitutes and your complementary products.</p>
<p>Page 169: price elasticity of supply. If it is more expensive to produce a product, you produce less. If the price of a product increases, supply increases decreases.</p> <p>On page 170: figure 9.6.</p> <p>The categories of elasticity of supply are the same as with elasticity of demand.</p>	<p>Right. On page 169, you will see the price elasticity of supply. If you have a look, right at the bottom, page 169, left-hand column, it is not as nice and bolded as it was with cross-elasticity of demand. The price elasticity of supply definition lies there in the second sentence: it is the change in the quantity supplied as a result of a change in price. Think back to chapter 7. If the inputs to the production process becomes too expensive...in other words, it becomes too expensive to supply goods to customers, are you going to supply more goods to consumers? If the price, or, if the cost of manufacturing goods increases, are you going to supply the same quantity as you did before the price increase? So it becomes more expensive, you are going to increase the price of your product, are you going to essentially sell more? If the price of production increases, the quantity supply is going to decrease, according to chapters 7 and 8. So price elasticity of supply measures the sensitivity of supply to changes in the price. Exactly as with demand. If you have a look on page 169: different categories, once again exactly the same. You will see figure 1.6: perfectly inelastic supply (figure A), perfectly elastic supply (figure E), it looks exactly the</p>

	same as what it does with demand, except you are explaining supply. The same goes with elastic, inelastic supply and unitary elastic supply.
Factors that affect elasticity of supply. On page 171: 1: time. Supply curves are inelastic in the short run as producers will produce regardless of the cost involved. They are elastic in the long term as producers would rather adjust production to keep costs to a minimum.	Now, on page 171...I want you to take note of the following: Your first point is time. In the short run, most supply curves are inelastic. In other words, if there is a change in price, you're still going to supply the same quantity to the market because you have already been manufacturing a certain amount. So once that product comes out of the factory, it's still the same amount. In the long run, the elasticity of supply becomes elastic, instead of inelastic, as what it was in the short run, because you have more time to adjust the amount that you produce.
	Your second is also going to depend on prices in the short run. So you have time. You have prices. It is there, it's just not in bold, it's at the end or at the bottom of page 171, left-hand column.
3: price expectations. If you expect prices to increase, (you need to know the chapters 7) you will increase the quantity supplied to the market.	Your third point is price expectations. If you are expecting...you manufacture tables, for example. So two of your inputs are wood, for the table top, and steel for the legs of the table. If you expect the price of wood to increase in two months' time, what are you going to do? Think back to chapters 7 and 8. What are you going to do? If you expect prices to increase, you are definitely going to purchase more of that product. What is going to happen to the quantity supplied?
four: stockpiling. ²⁴ Extra inventory is stored which would decrease supply at some point	Your fourth concept is stockpiling. Stockpiling refers to what? Remember, you have a factory, you are going to be producing 100 units a day. Whether or not you are supplying only 50 or 60 units, you are still going to be manufacturing 100 units. What happens to the remainder? You put it in warehouses.
Five: excess capacity. ²⁵ Products that can be stockpiled have a higher elasticity than those that cannot	Your next point is excess capacity. Products that can be stockpiled have a higher elasticity than those that cannot. Canned goods, for example: they can last quite a few months. Fresh goods: They only have a lifespan of a few days. Canned goods, in some cases, a few

²⁴ Explanation needed.

²⁵ Explanation needed.

	years, nevermind just a few months. The longer the lifespan, the more elastic or inelastic the supply?
Six: availability of inputs. ²⁶ Supply increases as inputs become more readily available.	Your last component: the availability of inputs. Once again you are manufacturing a table. So you need wood for the table top and steel for the legs. And, let's say that there is a forest, somewhere in Kwazulu-Natal, that is nearing maturity, so they are going to be chopped down and turned into planks, etc. any day now. So in other words you are expecting a definite increase in the quantity of input supplied. What is then going to happen to the quantity you supply and the elasticity of demand for that particular product? I want you to take note of those 5 points. Read through it. Time, prices, price expectations, excess capacity and availability of inputs.
You should know chapter 7. ²⁷	
You have to study the entire chapter. Look for definitions. Know examples.	Then, I want you to have a look on page 171: you'll see table 9.4. As with chapters 7 and 8, do not only study table 9.4. You have to study the entire chapter, but table 9.4 is a very nice summary. Know all the definitions. Please know examples. Those determinants, only the ones that I have mentioned, not the ones on page no-name, as I've indicated. If you give me those, I give you zero.
For chapter 10, prepare for next week. Your first test will be based on chapter 9, 10 and 11. all tests count	
otherwise you need a valid doctor's certificate we enforce rules, we don't make them up	
all marks must be on the official system in I can only make adjustments for two days after you must look at your marks, If you have 49%, do not ask me for more if you did not work if you have any queries	
Your homework does not have to be typed out the announcement on efundi, is in resources all homework assignments will be in that folder	

²⁶ Explanation needed.

²⁷ Unnecessary comment.

your homework for this chapter will be up on Monday in nine after each chapter you will write and efundi test that will be on Tuesday morning you have to do the test it's 20% off your participation mark	
See you next week	

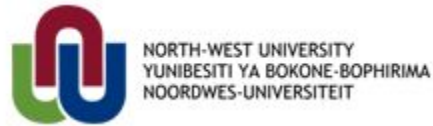
ADDENDUM F: Basic requirements of a model for calculating the accuracy rate of SLS produced via respeaking (Romero-Fresco, 2011: 144)

The model adopted must, as much as possible, meet the following criteria:

- “Be functional* and easy to apply. The use of multiple variables will probably help the researcher but not respeakers and trainers, who may have to calculate accuracy on a daily basis;
- Include the basic principles of WER calculations* in SR theory, which have been tested and validated for long;
- Take into account the original spoken text*, which allows to identify what has been omitted, changed, etc.;
- Take into account the possibility of edited* (summarized, expanded, etc.) and yet accurate respeaking;
- Allow specificities* of different languages while, at the same time, being applicable to all languages and account for on-air corrections;
- Provide, at the end of the day, not only an idea of the quality in terms of accuracy but also of what must be improved* (and perhaps even how).”
(Romero-Fresco, 2011:144)

*Author’s emphases

ADDENDUM G: Consent form – second research cycle



Informed consent form

Part 1: General project information

This section provides you, as participant in the project, with more information, so that you can make an informed decision about whether or not you want to participate in the experiment.

1. Title of the project

The impact of subtitling on student comprehension

2. Institution: Focus area UPSET at the NWU.

3. Name(s) and contact details of project leader(s)

3.1 Ms Fanny Lacroix

- Function in project: project leader / contact person
- Qualifications: BA Hons in Language Practice
- Telephone: 016 910 3493
- Postal address: PO Box 1174, Vanderbijlpark 1900

3.2 Prof. Jan-Louis Kruger

- Function in project: project leader / contact person
- Qualifications: PhD
- Telephone: 016 910 3481
- Postal address: PO Box 1174, Vanderbijlpark 1900

4. You are approached to take part in this project and may now have the following questions:

4.1 What are the set requirements that persons must meet to be able to take part in the project?

Why and how was I chosen?

You are a student enrolled for ECON 111 and for CTSS.

4.2 What is the purpose of this project?

The purpose of this project is to determine whether the introduction of same-language (English) subtitles in a facilitation class for ECON111 will help improve comprehension.

4.3 What will be expected of me as participant? In which interventions/procedures will I have to take part? What exactly will it involve?

You will attend the ECON 111 and 121 classes you have registered for, as normal. After the last classes in the semester, you will be expected to complete the following evaluations: an English academic language and literacy evaluation (TALL), a subject-specific comprehension test as well as a reading evaluation. Please note that the results of these tests will NOT be taken into consideration when calculating your participation mark for ECON 111 and 121. You will also be expected to complete the evaluations given to you by your lecturer as part of the ECON 111 and 121 course. These results WILL be taken into account when calculating your participation mark for ECON 111 and 121.

4.4 What are the potential discomforts and/or potential dangers and/or potential permanent consequences (however negligible) that participation in this project holds?

This study involves no dangers, nor discomforts or nor negative permanent consequences apart from the potential benefits of double exposure to lecture content. If you are not in the test group who will see the subtitles, you will have the opportunity on completion of the course to see the lectures with subtitles on DVD before the exam. If you are in the control group you will see the DVD once a week without subtitles. Participants may take a few weeks to get used to the subtitles, but this should not cause any discomfort.

4.5 What precautions have been taken to protect me as participant?

The reporting of data will be completely anonymous. Your name will not be mentioned.

4.6 How long am I expected to be involved in the project?

The project will take place over the course of 2011. You will be participating in the project while attending ECON 111 and 121 classes.

4.7 What direct benefits can I expect from the project? What remuneration (monetary or services) can I expect for my participation?

There are no direct benefits other than the opportunity to take part in a research project that may lead to the implementation of a method to improve the academic literacy and academic performance of EAL students, and the possibility to improve your comprehension of this subject.

4.8 What potential general benefits are there for the broader community, which may arise from the project?

The project may lead to the implementation of a method to improve the academic literacy and academic performance of EAL students in general.

4.9 How will the findings of the project (general and individual results) be made available or conveyed to me?

Should you wish to find out about the results of the study, please contact Prof. Jan-Louis Kruger (see 3.4 for contact details).

4.10 What measures have been taken to handle and store my data confidentially?

No names or university numbers will be used when reporting on the data. Although your biographical details will be used to organise the data, this information will not be linked to your identity and it will not be possible to identify you from the data.

As project leader, I confirm to participants that the above information is complete and correct.

Signature of project leaders

Date

Signed at: _____
Place of signature

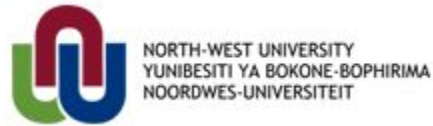
Part 2: General principles

To the signatory of the consent contained in Part 3 of this document.

You are invited to take part in the research project described in Part 1 of this informed consent form. It is important that you also read and understand the following general principles, which are applicable to all participants in this research project.

1. Participation in this research project is voluntary, i.e. no pressure will be put on you to take part. However, you will still be expected to attend ECON 111 and 121 lectures in the group that you have been allocated to and not move to another group. You will also be expected to attend the compulsory facilitation classes scheduled under CTSS and not change groups.
2. It is possible that you will not derive any personal benefit from taking part in this research project. However, the knowledge that may be gained by means of this project may benefit other people or communities in the future.
3. You are free to withdraw from the project at any time, without stating reasons, and you will not be harmed in any way by doing so. You may also request that your data no longer be used in the project. However, you are kindly requested not to withdraw without careful consideration since this may have a detrimental effect on the statistical reliability of the project, among others. Also note that, should you decide to withdraw from the project, you will still have to attend ECON 111 and 121 classes. Withdrawing from the project does not entitle you to stop attending classes.
4. By agreeing to take part in this project, you are also giving consent for the data that will be

ADDENDUM H: Consent form – third research cycle



Informed consent form

Part 1: General project information

This section provides you, as participant in the project, with more information, so that you can make an informed decision about whether or not you want to participate in the experiment.

1. Title of the project

The impact of audiovisual support on student comprehension

2. Institution: Focus area UPSET at the NWU.

3. Name(s) and contact details of project leader(s)

3.1 Prof. Jan-Louis Kruger

- Function in project: project leader / contact person
- Qualifications: PhD
- Telephone: 016 910 3481
- Postal address: PO Box 1174, Vanderbijlpark 1900

3.2 Ms. Fanny Lacroix

- Function in project: project co-leader
- Qualifications: BA Hons in Language Practice

4. You are approached to take part in this project and may now have the following questions:

4.1 What are the set requirements that persons must meet to be able to take part in the project? Why and how was I chosen?

You are a student enrolled for PSYC121.

4.2 What is the purpose of this project?

The purpose of this project is to determine whether the introduction of audiovisual support in the form of recorded lectures will help improve comprehension.

4.3 What will be expected of me as participant? In which interventions/procedures will I have to take part? What exactly will it involve?

You will attend the PSYC121 classes you have registered for, as normal. You will also attend a

weekly practical class for PSYC121 during which you will be shown an edited video recording of the previous week's lecture. After each video, you will write a short comprehension test based on the content of the lecture. The sum of the marks for all these tests will make up an additional, optional, third test mark for PSYC121 in addition to two scheduled class tests during normal contact time. The best two of the three class test marks will be used, together with your assignment mark and the mark for the semester test in calculating your participation mark for the semester. After the last classes in the semester, you will be expected to complete an English academic language and literacy evaluation (TALL).

4.4 What are the potential discomforts and/or potential dangers and/or potential permanent consequences (however negligible) that participation in this project holds?

This study involves no dangers, nor discomforts or nor negative temporary nor permanent consequences apart from the potential benefits of double exposure to lecture content. Participants may take a few weeks to get used to the subtitles, but this should not cause any discomfort.

4.5 What precautions have been taken to protect me as participant?

The reporting of data will be completely anonymous. Your name will not be mentioned.

4.6 How long am I expected to be involved in the project?

The project will take place over the second semester of 2011. You will be participating in the project while attending PSYC121 classes.

4.7 What direct benefits can I expect from the project? What remuneration (monetary or services) can I expect for my participation?

There are no direct benefits other than the opportunity to take part in a research project that may lead to the implementation of a method to improve the academic literacy and academic performance of students, and the possibility to improve your comprehension of this module.

4.8 What potential general benefits are there for the broader community, which may arise from the project?

The project may lead to the implementation of a method to improve the academic literacy and academic performance of tertiary students in general.

4.9 How will the findings of the project (general and individual results) be made available or conveyed to me?

Should you wish to find out about the results of the study, please contact Prof. Jan-Louis Kruger

(see 3.1 for contact details).

4.10 What measures have been taken to handle and store my data confidentially?

No names or university numbers will be used when reporting on the data. Although your biographical details will be used to organise the data, this information will not be linked to your identity and it will not be possible to identify you from the data.

As project leader, I confirm to participants that the above information is complete and correct.

Signature of project leader

Date

Signed at: _____

Place of signature

Part 2: General principles

To the signatory of the consent contained in Part 3 of this document.

You are invited to take part in the research project described in Part 1 of this informed consent form. It is important that you also read and understand the following general principles, which are applicable to all participants in this research project.

1. Participation in this research project is voluntary, i.e. no pressure will be put on you to take part. However, you will still be expected to attend PSYC121 practical classes in the group that you have been allocated to and not move to another group.
2. It is possible that you will not derive any personal benefit from taking part in this research project. However, the knowledge that may be gained by means of this project may benefit other people or communities in the future.
3. You are free to withdraw from the project at any time, without stating reasons, and you will not be harmed in any way by doing so. You may also request that your data no longer be used in the project. However, you are kindly requested not to withdraw without careful consideration since this may have a detrimental effect on the statistical reliability of the project, among others. Also note that, should you decide to withdraw from the project, you will still have to attend PSYC121 classes. Withdrawing from the project does not entitle you to stop attending classes.
4. By agreeing to take part in this project, you are also giving consent for the data that will be generated to be used by the researchers for scientific purposes as they see fit. In return, we commit ourselves to keep the data confidential and anonymous.
5. You will be given access to your own data upon request, unless the Ethics Committee

Student number: _____

1. **What is your mother tongue/home language?** _____
2. **What is your first additional language?** _____
3. **Is Psychology one of your major subjects?** _____
4. **What is the name of the school from which you matriculated?** _____
5. **What year did you matriculate?** _____
6. **What is your age?** _____
7. **Are you male or female?** _____
8. **How much television do you watch on average per day (in hours)?** _____