

**Webcasts for Developing English Listening  
Skills among Biology Majors at the Faculty  
of Education**

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**Abstract**

This research aimed to develop the English listening skills among Biology majors at the Faculty of Education. The research design was one group pre and post-test quasi-experimental design. The participants were 58 sophomores (2<sup>nd</sup> year) students of Biology department at Ismailia Faculty of Education in Suez Canal University. To help them teach Biology in English successfully in their future career as Biology teachers at language schools, webcasts were prepared and oriented towards the participants' practice of the listening comprehension skills (Listening for Specifics, listening for Details and Interpreting Cause & Effect) as well as critical listening skills (Evaluating, Comparative Analysis and Inferring) within the context of Biology. There were nine webcasts for listening comprehension and nine webcasts for critical listening. Four tools were developed, validated and implemented by the researcher. They were: 1) Needs Assessment Questionnaire, 2) Listening Comprehension Test, 3) Critical Listening Test and 4) Two Online Opinion Polls. The findings revealed that webcasting, as a proposed pedagogy, had a high positive impact on the target English listening skills among sophomore Biology majors.

**Key Words:** Webcasts, Webcasting, ESP, Scientific English, English for Science, Listening Skills, English for Biology, Listening Comprehension and Critical Listening.

### مستخلص:

هدفت الدراسة إلى تنمية مهارات الاستماع باللغة الانجليزية لدى طلاب شعبة البيولوجى بكلية التربية. وكان التصميم التجريبي للدراسة هو تصميم المجموعة الواحدة. وكانت عينة الدراسة مجموعة من (58) من طلاب الفرقة الثانية بشعبة البيولوجى بكلية التربية بالإسماعيلية (جامعة قناة السويس). ولتمكينهم فى مهنتهم المستقبلية على تدريس مادة البيولوجى باللغة الانجليزية بمدارس اللغات، تم اعداد أداة المعالجة التجريبية وهى البث عبر الانترنت وتوجيهها نحو تدريبهم على مهارات الاستماع باللغة الانجليزية التالية فى سياق علمى لتخصص البيولوجى: الاستماع الاستيعابى (الاستماع من أجل البحث عن معلومات محددة، الاستماع من أجل التفاصيل، تفسير السبب والنتيجة) والاستماع الناقد (التقويم، التحليل المقارن، الاستدلال). وكانت هناك تسع مرات للبث عبر الانترنت للاستماع الاستيعابى وتسعة أخرى للاستماع الناقد. وهناك أربعة أدوات من اعداد الباحث وهى استبيان تقييم الاحتياجات، اختباران قياس للتحقق من الفروض وفاعلية المشروعات الشبكية وهما: اختبار الاستماع الاستيعابى، واختبار الاستماع الناقد وقد تم التحقق من صدقهما وثباتهما، وبالإضافة إلى استطلاعين للرأى على الانترنت أحدهما لقياس مستوى رضا الطلاب بشعبة البيولوجى والآخر للتحقق من مدى أستفادتهم من البث عبر الانترنت. وأسفرت نتائج الدراسة عن أن البث عبر الانترنت كنموذج تدريسي مقترح له تأثير إيجابى مرتفع على تنمية مهارات الاستماع باللغة الانجليزية المستهدفه لدى طلاب الفرقة الثانية بشعبة البيولوجى.

**الكلمات المفتاحية:** البث عبر الانترنت، اللغة الانجليزية لأغراض خاصة، اللغة الانجليزية للبيولوجى، مهارات الاستماع باللغة الانجليزية، الاستماع الاستيعابى، الاستماع الناقد.

## Background and Problem

Online teaching is getting more urgent owing to the pandemic of COVID-19. In this regard, Stickler et al. (2020) assert the need for online language teaching by integrating technology into language programs for distance learning. As a form of online teaching, the

technology of webcasting reinvents the lectures as it allows for educational visual and audio communications that are interactive, engaging, flexible and robust (Baecker et al., 2009). Webcasting is an important method of modern internet teaching that is widely used in various stages of education for delivering audio and video presentations so that learners can participate via their own personal digital devices in their locations (Zhao & Ma, 2020). Accordingly, it considers the social distance measures among learners as a protection from COVID-19 while managing the process of teaching and learning remotely and successfully. Educational webcasts promote the training procedures in educational institutions as they are widely accepted among learners who exhibit a high degree of reliability and credibility in the context of educational webcasts (Giannakos & Vlamos, 2013).

In spite of the worldwide use of Information and Communication Technology (ICT) in language teaching and learning, more research is needed to determine the impact of using internet technology in English for Specific Purposes (ESP) area (Constantinou & Papadima-Sophocleous, 2020). As a branch of ESP, English for Scientific Purposes (EScP) lacks reviews on implementing technologies in teaching and learning language and, in turn, needs more research to determine the effect of using web and online technology (Liu et al., 2014). Therefore, the current research attempted to use webcasts for developing the Faculty of Education Biology majors' English listening skills for specific purposes. Since ESP listening depends on the

students' target specialized field (Khalid, 2017), listening was provided, in the current research, within the context of Biology.

Biology majors at Faculties of Education are assigned to use English when teaching Biology at the Egyptian experimental language schools during their teaching practice in the 3<sup>rd</sup> and 4<sup>th</sup> years as well as in their future career. However, they are in a bad need of learning English for Biology as they usually experience severe problems when the medium of Biology instruction changes from their native language (Arabic) to English language at such schools. For further investigation of such a problem, pilot studies were conducted in the first semester of the academic year 2020–2021.

A content analysis was conducted for the English courses given to the biology majors in the four years at Ismailia Faculty of Education in Suez Canal University. The English courses of the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> years are general English courses for general English skills rather than ESP courses for developing the language skills within the context of Biology. The English course of the 4<sup>th</sup> year is an ESP but it is English for Education and not for science. Moreover, all these courses are void of listening skills and they are provided to all students of all departments at the Faculty of Education. Consequently, there is no English for Biology course that helps Biology majors develop their language skills, including listening, within the context of Biology.

As a preliminary investigation, open interviews were administered with 12 supervisors of English at Ismailia Inspectorate of English

Language, 9 supervisors of Biology at Ismailia Inspectorate of Science, 10 in-service Biology teachers in the secondary stage at experimental language schools as well as 57 junior (3<sup>rd</sup> year) & 34 senior (4<sup>th</sup> year) Biology majors at Ismailia Faculty of Education. Questions were asked about the difficulties that Biology majors might encounter when teaching Biology in English during the teaching practice at experimental language schools, the importance of English Language for the Biology teachers joining the experimental language schools to teach Biology in English and how bad Biology majors at the Faculty of Education need English listening skills for their future career at language schools. The results revealed the following:

- Biology majors' rejection of joining experimental language schools during the teaching practice because of their inability to teach Biology in English.
- Biology majors' urgent need of professional language development via English for Biology course supporting their acquisition of the necessary listening skills.
- Listening skills allow Biology majors to acquire the English terminology of Biology as well as help them deeply comprehend and successfully talk about spoken scientific English texts within the context of Biology.
- Biology teachers must pass a scientific English test to join experimental language schools and teach Biology in English.

For further investigation, a digital listening test was piloted with 80 biology majors (20 biology majors from each of the four years) at Ismailia Faculty of Education. Almost all of them (97.5%) showed extremely poor performance at English listening within the context of Biology. As a result, there are critical issues with the biology majors' performance of English listening skills.

### **Statement of the Problem**

Listening skills are important for the biology majors' future career as Biology teachers in the preparatory and secondary stages at language schools. However, Biology majors at Ismailia Faculty of Education are not eligible to teach Biology in English since they mostly lack the necessary listening skills that help them understand and talk about scientific information in English within the context of Biology. Moreover, there is no English for Biology course that help them develop listening skills within the context of Biology.

### **Questions**

This research sought to find answers to the following questions:

1. What are the English listening skills mostly needed by the sophomore Biology majors at the Faculty of Education?
2. What are the features of the webcasts for the English listening skills within the context of Biology?
3. What is the effect of those webcasts on developing the English listening skills among the sophomore Biology majors at the Faculty of Education?

4. To what extent is the webcasting beneficial and satisfactory to the sophomore Biology majors at the Faculty of Education?

### **Hypotheses**

1. There is a statistically significant difference between the mean scores of the sophomore Biology majors' English listening comprehension skills in the pre- and post-administrations of the listening test in favor of the post-administration.
2. There is a statistically significant difference between the mean scores of the sophomore Biology majors' English critical listening skills in the pre- and post-administrations of the listening test in favor of post-administration.
3. There is a statistically significant difference between the mean scores of the sophomore Biology majors' overall English listening skills in the pre- and post-administrations in favor of the post-administration.
4. Webcasting, as a proposed pedagogy, has a high positive impact on the target English listening skills among sophomore Biology majors.

### **Aim**

Developing the sophomore Biology majors' English listening skills mostly needed for their future career as Biology teachers in the secondary stage at language schools.

### **Delimitations**

The current research was delimited to the following:

1. Sophomore (2<sup>nd</sup> year) Biology majors at Ismailia Faculty of Education in Suez Canal University in Egypt.
2. Six independent English listening skills were selected since they were ranked as mostly needed and highly recommended in common by the majority of following three main sources of the needs assessment questionnaire:
  - a. University staff members in the fields of TEFL and Science Teaching.
  - b. In-service employees (Biology teachers in the secondary stage at experimental language schools as well as Supervisors at the Ismailia Inspectorate of English Language and Science).
  - c. Junior and Senior Biology majors at Ismailia Faculty of Education.

These six skills are handled independently which means they are not integrated with speaking or writing. These skills are totally stand-alone listening skills that are grouped into two categories as follows:

First, the following are three listening comprehension skills:

1. Listening for Specifics	Selecting the right meaning of the given Biology terminology.
	Providing the appropriate Biology terms.
	Finding examples for scientific statements.
2. Listening for Details	Figuring out explicitly and implicitly spoken important details in Biology.
3. Interpreting Cause & Effect	Identifying causes and effects for the scientific statements of Biology.

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Second, the following are three critical listening skills:

1. Evaluating	Deciding between correct and incorrect scientific statements of Biology.
2. Comparative Analysis	Categorizing scientific features within the context of Biology by matching differences with their categories.
3. Inferring	Selecting the appropriate inferences within the context of Biology for the given scientific statements.

## Review of literature and related studies

### 1. Listening Skills

This section tackled the English listening skills to prepare a list of skills for part one of the needs assessment questionnaire that aimed to find out the mostly needed skills by the sophomore majors of Biology at Ismailia Faculty of Education. ESP Listening has many similarities to General English (GE) Listening since both require use of the same skills to facilitate comprehension and communication (Khalid, 2017). Hence, the following parts of this section manipulated the listening comprehension and critical listening skills in EScP.

#### 1.1 Listening Comprehension

Listening comprehension is an independent skill closely related to understanding the spoken information and the meaning intended by the speaker (Wah, 2019). Therefore, it is a complex skill that requires lots of practice to reduce the burden of comprehension (Vandergrift, 2016). It is a vital receptive skill in all areas of academic life and it is

necessarily required in order for higher education students to understand lectures and tutorials (Picard & Velautham, 2016). In this regard, Ahmed (2015) and Maslova (2017) pinpoint the following essential ESP listening comprehension skills for English language learners:

1. Listening for gist: Learners listen for global understanding to get the main idea or whole picture with the same sequence of spoken information.
2. Listening for details: Learners listen to get as much explicit and implicit information as possible. Here, they listen to understand all the information provided in the listening material.
3. Listening for specific information: Learners listen to extract the needed important information and reject unimportant ones that are not needed in light of inquiries provided before listening in order to answer them while listening.
4. Guess the meaning of unknown words within a listening context.

Phillips & Phillips (2016, p.2) refer to the following listening comprehension skills within the context of science:

1. Using visuals in spoken scientific presentations for understanding.
2. Listening for signpost words in lectures.
3. Understanding spoken examples.
4. Making notes during a talk.
5. Listening for definitions.
6. Recognizing separate points.

In environmental and biomedical science, Lee (2009, p.5) and Chrimes (2015, p.5) manipulate the following listening comprehension skills:

1. Understanding lecture organization.
2. Using different information sources.
3. Using symbols and abbreviations in note-taking.
4. Understanding speaker emphasis.
5. Recognizing digressions in lectures.

In natural science, Santillana (2008, pp. 20–124) tackles the following listening comprehension skills:

1. Expressing causes and results.
2. Interpreting spoken scientific information from lectures.
3. Following instructions to make experimental models.
4. Explaining spoken natural cycles.
5. Understanding spoken scientific formulas.

## **1.2 Critical Listening**

Critical Listening is the evaluation of spoken information via deep comprehension of the message in order to form judgments about the message for acceptance or refusal (Wah, 2019). It helps in examining orally provided information to assess the speaker's argument for problem-solving or making decisions (Lamm, 2019). Vandergrift and Goh (2012) state that drawing inferences or inferential listening is an essential critical listening skill in which learners fill in the gaps in their

understanding by using language combined with their relevant prior knowledge.

In environmental and biomedical science, Lee (2009, p.5) and Chrimes (2015, p.5) refer to the critical listening skills of predicting lecture content from introduction as well as evaluating speakers' stances in spoken lectures.

In natural science, Santillana (2008, pp. 20–124) handles the following critical listening skills:

1. Comparing between spoken scientific facts.
2. Analyzing spoken scientific illustrations for cycles and sequence of events.
3. Classifying of scientific information provided in lectures
4. Drawing inferences based on the results of scientific experiments in lectures.
5. Assessing scientific assumptions or hypotheses in lectures.

### **1.3 Conclusion**

Based on the literature review of English listening comprehension and critical listening skills, a closed-ended list of 18 listening comprehension skills as well as 10 critical listening skills was formed as a part of the needs assessment questionnaire with a three-level gradual scale (not needed, needed and mostly needed). This gradual scale was developed and submitted to the university staff members of Science Teaching and Teaching English as a Foreign Language

(TEFL), the supervisors of English and Science, teachers of Biology as well as junior and senior Biology majors at the Faculty of Education. It allowed them to decide how each of these English listening skills was essential for the biology majors' competence in teaching Biology in English during the teaching practice and in their future career at experimental language schools.

## **2 Webcasting**

This section reviewed the literature related to webcasting in order to identify the features of the webcasts prepared to develop the biology majors' listening skills.

### **2.1 Definition**

Several definitions are there for webcasting by Strain (2020); VIXY (2020); The Audiopedia (2016); Informatics Inc. (2013) and WEBCAST Inc. (2012). However, they all share the following:

1. A media presentation streamed online to distribute content from a single source to many participants simultaneously via different digital devices such as computer, tablet, laptop or cell phones.
2. Video or audio stream is broadcasted live for immediate viewing or on-demand for playback and delayed use.
3. Allowing for audience's communication with the webcaster via chat for file sharing, Q&A and polls.

In light of the common features among the webcasting definitions as well as the research variables, webcasting can be procedurally defined as online broadcasted presentations of audio & video media

for practicing English listening skills within the context of Biology so that these online presentations are:

- Streamed live for immediate viewing and archived for on-demand playback via Biology majors' digital devices (e.g., Tablet and Cell Phone) in their locations.
- Supported by interactive embedded listening quizzes.
- Followed by extra recommended listening resources.
- Concluded by Questions & Answers (Q&A) for students' inquiries at the end of the real-time streaming.

## **2.2 Types**

WEBCAST Inc. (2012) illustrates that webcasting occurs in two main types as the content of the online broadcasted presentation is transferred to streaming software running on the participants' digital devices and then it is compressed to be sent to a specialized server which is Content Delivery Network (CDN). This CDN delivers the presentation media onto the internet either live for instant viewing or on-demand for later access. As for Live Webcasting, it is also called real-time webcasting and it allows for the attendants' interaction as well as immediate viewing for live streaming sessions (Wolf, 2016). In On-demand Webcasting which is also called archived webcasting, streams are recorded and saved for later access anytime with their contents such as website links, desktop applications and documents in order to expand the reach and impact of student training (Smith, 2013). Accessibility of webcasts in real-time and via archives makes

webcasting useful for learning, communication as well as knowledge sharing and creation (Baecker et al., 2009).

In the current research, both types were used so that the participants could:

1. Have the opportunity, in live webcasting, to communicate with the webcaster (presenter) for Q&A as well as polls.
2. Repeat the broadcasted presentations with their embedded links and desktop applications for listening materials and interactive quizzes, for reviewing and deeper practice in on-demand webcasting. At the same time, those absent students could view their missed broadcasted sessions.

### **2.3 Benefits**

Webcasting is increasingly essential worldwide as it boosts the impact of productive meetings, sessions, events, etc (LEMG, 2020). It provides easy access to large audience remotely and conveniently in their comfortable locations via online high-quality video streaming (Khandelwal, 2017). Thus, it helps the presenter contact directly with the target participants in a way that considers COVID-19 measures. It also promotes richer presentation content materials by flexible use of multimedia (WEBCAST Inc., 2012). The presenter, as a webcaster, can reach the participants both real-time via live streaming and afterwards via archiving videos for delayed use (Mediaplatform, 2010, p.2). During webcasting, participants can interact and communicate

via polls, presentation file share and Q&A chats (LiveLinking Media, 2014).

#### **2.4 Criteria of selecting the best Webcasting Software**

There are lots of webcasting software; however, the best one for the webcaster depends on a number of factors as referred to by Patel (n.d.):

##### **1. Number of attendees**

Some webcasting applications support a few numbers of attendants whereas others promote the participation of a large audience. This depends on the webcaster's participants in the presentation.

##### **2. Audio and video quality**

The higher the quality of audio or video streaming without causing lagging to the feed, the better the participants' focus on the content of the presentation and the less probability of their dropping out mid-presentation.

##### **3. Event management tools**

There are webcasting applications that simplifies the webcaster's event management before, during and after the presentation. The simpler the event management tools are, the better it facilitates the webcaster's presentation and guarantees better control over the participation of the audience and their attendance. The more beneficial event management tools are involved in the webcasting software, the more interactive features are involved like audience polling, file sharing and slide share.

#### 4. Recording capabilities

The best webcasting software is the one that provides the recording service that enables the participants and the webcaster to record the live streaming for later playback. This on-demand viewing helps the absent audience watch the missed webcasting sessions and enable the attendants to repeat them for deeper understanding and/or more practice.

#### 5. Reporting and analytics

A webcasting software should provide a reporting tool like the number of attendants and their locations.

In light of these criteria of selecting the best webcasting software, the webcasting software used in the current research is Webex Meetings since it is one of the six top webcasting applications (Patel, n.d.) with the technical specifications that support the following webcasting features as pinpointed by Hooda (2021):

- Live and On-demand audio or video presentations.
- Automated Archiving (Making real-time sessions available for playback).
- Working on different devices (e.g., PC, Tablet, Laptop and Mobile Phones) and operating systems (e.g., Windows and Android).
- Unlimited audience or participants.
- Social interactions for Q&A during the streaming & polls by end of sessions.
- Screen Sharing for webcaster's presentation materials.

- Certifying audience or participants with ease (Sending webcaster's files for formative assessment quizzes).
- Management Tools for scheduling, recording, file sharing, registration and attendance.
- High quality audio & video broadcasting online.
- Unlimited broadcasting time and on-demand viewing.

### **2.5 Webcasting in Higher Education**

Compared to traditional class-room teaching, webcasting is proved to be successful in higher education since it provides the option of archiving the Live Streaming lectures to be on the server for later access and use by students anytime and anywhere via the Video On-Demand (VOD) mode (Yunus et al., 2006 and O'baoill, 2009). The more webcast viewing via archived webcasts, the higher students' performance is (Traphagan et al., 2010). From this perspective, Jones (2017) carried out a research aiming to determine the effect of live and recorded webcasts. The results showed the benefits of combining both of live and recorded sessions. In live webcasts, participants appreciated interaction and the ability to clarify information without delay; whereas, in recorded webcasts, they valued the elements of ease of use, convenience and flexibility.

As for improving and enhancing students' performance level in higher education, Sitarungsri's study (2011) aimed to evaluate the use of webcasting to promote students' learning at the college of Nursing. Findings reported outstanding achievements of Nursing

graduate students owing to the webcasting's construction of online social communities and successful transfer of knowledge and skills to students in their locations. In their study, Lust et al. (2012) pinpointed students' continuous use of educational webcasts due to their growing perception of webcasts' usefulness via over time exposure. Another study was conducted by Freguia (2017) that revealed webcasts' promotion of 4<sup>th</sup> year engineering students' learning in an elective course as those webcasts encouraged and expanded their active participation.

Educational webcasts are effective and have high performance when applied to tasks that require comprehension as shown in the findings of Giannakos' and Vlamos' study in 2013. This is in line with Nagy's and Bernschutz's study (2016) which also proved webcasts' high impact on students' learning performance and achievement in higher education. In their study, they figured out the positive effectiveness of using online video presentations via webcasting on the increasingly improved learning performance of the students in the business faculty.

Webcasting, particularly the live one, is going to change the future of learning regarding the teaching methodology and interactivity (Wolf, 2016). In this respect, a study conducted by Zhao and Ma in 2020 to discuss webcasting of physical education in higher vocationally colleges during the pandemic of COVID-19. The findings revealed the importance of combining webcasting with face-to-face classroom

teaching in higher education as it changes the teacher–student relationship so that the teacher is a service provider rather than the only source of information and the learner becomes knowledge builder and collaborator for lifelong learning.

## **2.6 Internet Technology and Language Learning in ESP**

Looking forward to future developments and possible implementation in teaching ESP in higher education in Greece, Dogoriti's and Pange's study (2012) aimed to investigate university tutors' perceptions, motivations and engagement with the use of web technology in their ESP classes. The findings highlighted the need for more extensive use of internet broadcasting in ESP, showing university tutors' positive motivation to use webcasting owing to its benefits in teaching ESP. Hereby, Constantinou and Papadima–Sophocleous (2020) administered a study in which they recommended the inclusion of using technology for the professional development of ESP teachers owing to the necessity of integrating internet technology in ESP teaching and learning.

Regarding English for Scientific Purposes, a review paper was administered by Liu et al. (2014) to address English language learning and teaching within the context of Science via Computer–Assisted Language Learning (CALL) approach and determine the use of learning technologies in science–based literacy. More specifically, Bouabdallah conducted a research in 2015 to find out the difficulties that Biology students faced while practicing listening and speaking

skills within the context of their specialized field. The findings revealed the power of using internet technology resources to reinforce students' existing practice of those skills in their ESP classes by providing them with authentic audio and visual language materials within the context of their major.

In case of language skills, university students support online foreign language teaching to develop and practice their language skills as shown in Yuce's study in Turkey (2019). For listening skills, internet technology is a useful resource (Dang et al., 2012). Therefore, Baehaqi (2014) carried out a study to improve the listening skills among the students of English department in Kanjuruhan University by using podcasts as useful internet technology resources. Findings proved the positive effect of podcasts on improving the basic listening comprehension skills including guessing the meaning within a context as well as skimming since podcasts promoted low proficient students' repetitive and frequent practice of listening.

For critical language skills, Liu et al. (2014) state the necessity of providing EScP students with critical thinking skills in their language learning since there is a limited number of studies on how language teaching can be applied into EScP compared to the other fields in ESP. By Poce et al. (2017), a research was carried out in order to help develop university students' argumentative skills and critical evaluation skills via webcasting. The findings showed the high impact of using webcasting activities in ESP online classes via videos and

guided discussions on students' critical thinking skills of prompted reasoning, elaboration of ideas as well as knowledge connections within language writing skills.

### **2.7 Techniques of Webcasting**

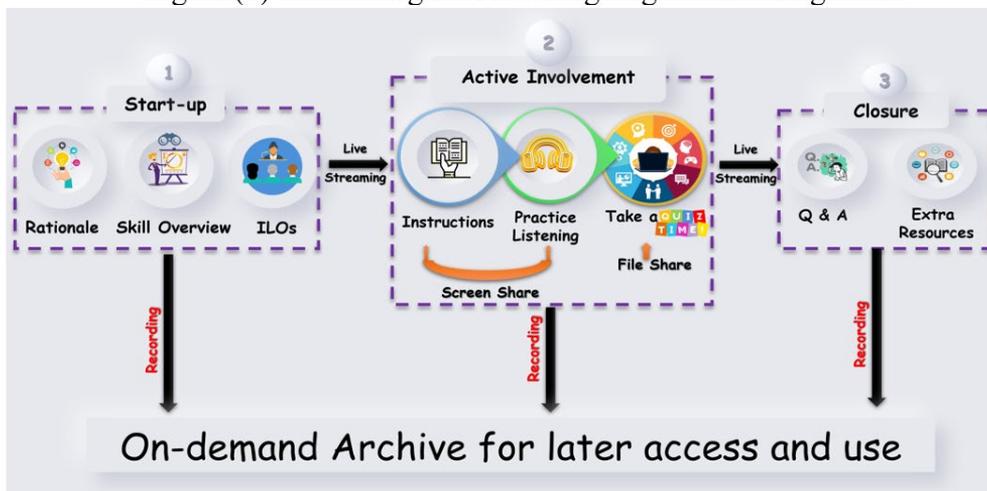
Strain (2018) refers to the following six webcasting techniques that take the webcaster's presentation to the next level:

1. Make an impression from the first moment by branding your registration pages and emails of the attendees.
2. Create a hook as a warm-up at the start of your webcast to attract the hosts' attention and let them focus on the key elements of the webcast.
3. Keep your audience engaged during the actual presentation of your webcast with interactive questions.
4. Screen share the presentation materials of your webcast in order to make your presentation clear and concise as well as delivers a robust experience for your audience.
5. Go social and poll your audience to make sure that the webcasting content is relevant to them.
6. Provide a proper conclusion for the presentation of your webcast.

### **2.8 Proposed Model of Webcast Pedagogy**

In light of the webcasting techniques as well as the research aim of developing listening, the following figure shows a proposed model for the features of webcasting as a pedagogy for developing English listening skills among Biology majors at the Faculty of Education.

Figure (1) Webcasting for Practicing English Listening Skills



This figure of the proposed model shows the use of two types of Live and On-demand Webcasting. It starts with the live webcasting for 2 hours with the recording option of archiving the live streaming for later use and access by students who missed the live webcast or those students who need to review for deeper practice. According to the figure, there are three main stages of a webcast for practicing English listening:

### 1. Start-up

First, the webcaster performs technical checks with the participants to make sure of a successful log-in with audio and/or video connection. Students are informed about their ability to record the live webcast or download the automatically archived one by the end of the live streaming. The start-up duration is 15 minutes. It mainly aims to give an effective warm-up to hook the participants' attention on the key elements of the webcasted presentation by:

- a. Making the listening task meaningful as it is rationally connected to students' experiences.
- b. Providing an overview for the target listening subskill which they will practice.
- c. Informing the students about the Intended Learning Outcomes (ILOs)

## 2. Active Involvement

In this 90-minute stage, students are get engaged with listening tasks. First, the webcaster shares the screen of the practice instructions where students read about the listening skill, topics, duration and steps for the listening practice. Then, another screen is shared for the videos as listening materials where students listen and watch carefully to practice the target listening skill. Finally, the webcaster sends a file of online interactive questions for the students to download and answer. These questions of the listening materials provide students with immediate constructive and corrective feedback. If they get a total score less than 90%, they go for the archived webcast anytime for reviewing and deeply practicing before the upcoming scheduled webcast.

## 3. Closure

Closure takes 15 minutes. Here, students' questions and answers (Q&A) are allowed in order to discuss any problems encountered while practicing listening as well as suggest possible solutions to overcome such difficulties in the coming webcasts. In such discussions, students'

responses are analyzed to figure out the reasons for their satisfaction level determined after conducting the online opinion poll of satisfaction. Students are reminded of the possibility of reviewing what they had experienced in the live webcast that was archived and recorded for later access and playback. This review aims to help unsuccessful students reach the mastery level before joining the next scheduled webcast. Moreover, the webcaster provides extra audio or video resources for students' extensive self-practice on the target listening skill after the live webcast.

## **Method**

### **1. Participants**

Fifty-eight sophomore Biology majors who were enrolled at Ismailia Faculty of Education in the academic year 2020–2021 participated in the study. Their age ranged between 18 and 19 years old. Resitters were excluded. The reason for this sample selection is that sophomore Biology majors are the ones who need to get themselves prepared to teach Biology in English during the teaching practice at experimental language schools when they become juniors (in the 3<sup>rd</sup> year).

### **2. Instruments**

#### **a. Needs Assessment Questionnaire**

Prepared by the researcher to answer the first research question, this paper-and-pencil questionnaire aims to identify the English listening skills that sophomore Biology majors at the Faculty of

Education mostly need to develop their language performance in order to teach Biology in English successfully and smoothly. It is divided into two parts. Part one was developed according to review of literature and related studies. It consists of a closed-ended list of 28 English listening skills (18 listening comprehension skills and 10 critical listening skills within the context of science) with a gradual scale of three levels (not needed, needed and mostly needed). Part two involves three open-ended questions. The first question is for the university staff members. The second one is for the supervisors of English & Science at Ismailia Inspectorate as well as teachers of Biology in the secondary stage at experimental language schools. The third one is for the junior and senior Biology majors at Ismailia Faculty of Education. Such open-ended questions in part two were given to gather as much information as possible regarding students' needs other than those in the close ended list.

The questionnaire was administered within three days in the 1<sup>st</sup> semester of the academic year 2020–2021. It was conducted on three main sources for needs analysis:

- 6 university specialists (3 TEFL and 3 Science Teaching staff members)
- 31 in-service employees (10 in-service Biology teachers in the secondary stage at experimental language schools, 12 supervisors from Ismailia Inspectorate of English Language and 9 supervisors of Biology from Ismailia Inspectorate of Science)

- 57 junior and 34 senior biology majors at Ismailia Faculty of Education.

#### b. Listening Comprehension Test

It is a digital listening test prepared by the researcher to provide a partial answer to the third research question. It works on electronic devices such as laptops, tablets and mobile phones. It aims to assess the target three listening comprehension skills. The test application can be downloaded or shared via Bluetooth in case of internet problems. The test duration is 2 hours. It is an objective test since the target listening comprehension skills are tackled independently (without integration with speaking or writing skills) and these skills are, in turn, assessed purely. In this respect, the questions of this test are Multiple Choice and Fill-in-the-Blank. There are five listening excerpts in form of videos ranging between 5 and 15 minutes. For each listening excerpt, there are 15 items underlying the question types of this test so that there are five items for each of the three listening comprehension skills. Fill-in-the-blank and Multiple-Choice questions are for the skill of listening for specifics; whereas Multiple-Choice is for the skills of listening for details and interpreting cause & effect. Test takers listen twice to each of the five listening excerpts and they are allowed to take notes during listening. In the first time, they listen for specifics by extracting the information needed to answer questions for the scientific inquiries provided before listening. In the second time, they listen to understand all the information involved in the listening

material in order to answer post-listening questions for implicit & explicit details as well as interpretation of cause & effect.

As for scoring, the answers are automatically estimated by the software of the test since it is an objective test whose items score zero for incorrect answers and one for correct answers. The total score is 75 points. The test results are submitted online via email or sent via Bluetooth share or flash drives in case of internet communication problems.

To check the validity of this test, a checklist was submitted to a jury committee of university TEFL staff members to verify each question's representation of the target listening comprehension skills with the intended learning outcomes. This checklist presented the three listening comprehension skills with their intended learning outcomes accompanied by their related test questions, and a three-level scale of consistency (Inconsistent, consistent and very consistent) between each of the three listening comprehension skills with its intended learning outcome and its test questions. As for the test reliability, Alpha ( $\alpha$ ) formula was used in order to estimate the reliability coefficient. The value of the reliability coefficient was (89.4%) for the Listening Comprehension Test. Thus, the test's reliability was established.

Finally, it was administered in two days before (27-28/3/2021) and after (17-18/5/2021) the treatment in the 2<sup>nd</sup> semester of the academic year 2020-2021 so that 29 participants were tested per day. It was individually submitted via students' own digital devices (Tablet,

Cell Phone or Laptop) in the lecture hall at the faculty or in the faculty's computer lab with a few students in case of unavailability of the digital devices that meet the minimum requirements of running the test application. Test results were sent to the tutor's official email. They were also collected by the researcher on a flash drive or received via Bluetooth in case of online disconnection or uploading problems. The participant's score was the total score of correct answers.

### c. Critical Listening Test

It is a digital test prepared by the researcher to provide a partial answer to the third research question. It works on electronic devices such as laptops, tablets and cell phones. It aims to assess the target three critical listening skills. The test application can be downloaded or shared via Bluetooth in case of internet problems. The test duration is 2 hours. It is an objective test since the target critical listening skills are tackled independently (without integration with speaking or writing skills) and these skills are, in turn, assessed stand-alone. In this respect, the questions of this test are Multiple Choice, True or False and Matching. There are five listening excerpts in form of videos ranging between 5 and 15 minutes. For each listening excerpt, there are 15 items underlying the question types of this test so that there are five items for each question type and there is one question type for each of the three critical listening skills (True or False for the Evaluating skill, Multiple Choice for the Inferring skill and Matching for the Comparative Analysis skill). Test takers listen once to each of the

five listening excerpts and they are allowed to take notes during listening.

As for scoring, the answers are automatically estimated by the software of the test since it is an objective test whose items score zero for incorrect answers and one for correct answers. The total score is 75 points. The test results are submitted online via email or sent via Bluetooth share or flash drives in case of internet communication problems.

To check the validity of this test, a checklist was submitted to a jury committee of university TEFL staff members to verify each question's representation of the target critical listening skills with the intended learning outcomes. This checklist presented the three critical listening skills with their intended learning outcomes accompanied by their related test questions, and a three-level scale of consistency (Inconsistent, consistent and very consistent) between each of the three critical listening skills with its intended learning outcome and its test questions.

As for the test reliability, Alpha ( $\alpha$ ) formula was used in order to estimate the reliability coefficient. The value of the reliability coefficient was (80.9%) for the Critical Listening Test. Thus, the test's reliability was established.

Finally, it was administered in two days before (29–30/3/2021) and after (19–20/5/2021) the treatment in the 2<sup>nd</sup> semester of the academic year 2020–2021 so that 29 participants were tested per day.

It was individually submitted via students' own digital devices (Tablet, Cell Phone or Laptop) in the lecture hall at the faculty or in the faculty's computer lab with a few students in case of unavailability of digital devices that could run the test application. Test results were sent to the tutor's official email. They were also collected by the researcher on a flash drive or received via Bluetooth in case of online disconnection or uploading problems. The participant's score was the total score of correct answers.

#### d. Two Online Opinion Polls

The first one is a satisfaction poll that has one question with six underlying statements to determine students' satisfaction with the webcasts for English listening. It was weekly conducted online via Webex Meetings application at the end of every three webcasts for practicing each of the target English listening skills. It was administered six times (once a week after the webcasts of each of the target six listening skills) in the 2<sup>nd</sup> semester of the academic year 2020–2021.

The second one is the usefulness poll that has one question with its inherent six statements. It aims to identify how the webcasts are beneficial for practicing the target listening skill within the context of Biology. This poll was administered online for one time by the end of the whole treatment.

For both polls, there is a 5-level continuum (Strongly disagree= 1, Disagree= 2, Neutral= 3, Agree= 4 and Strongly agree= 5) so that the participants click the most suitable number along the continuum for

each statement. All participants, enrolled in the current research, fully responded to the two online opinion polls. Data were gathered from both opinion polls for qualitative analysis so as to answer the fourth question.

### 3. Design

- a. Quasi-experimental method (One Group Pre and Post Test Design) was used to test the hypotheses.
- b. Descriptive method was used for literature review as well as the discussion of findings and analysis of data collected via online opinion poll.

## **The English Listening Webcasts**

There are two categories of English listening webcasts. The first one is Listening Comprehension Webcasts; whereas the second one is Critical Listening Webcasts. In each category, there are nine webcasts so that there are three webcasts for each English listening skill and there is one 2-hour webcast per day. In total, there are 18 webcasts with 36 hours of live-streaming for listening practice in addition to the extensive listening practice via archived webcasts as well as the recommended extra listening resources. The live-streaming webcasts for the listening practice are indicated in the following table:

Table (1) Webcasts for English Listening Skills within the context of Biology

English Listening Skills		Intended Learning Outcomes (ILOs)	Number of webcasts (one webcast per day)	Webcast Duration
Listening Comprehension Skills	Listening for Specifics	<ul style="list-style-type: none"> <li>Selecting the right meaning of the given terminology.</li> <li>Providing the appropriate Biology terms.</li> <li>Finding examples for scientific statements.</li> </ul>	3	2 hrs. per a webcast
	Listening for Details	<ul style="list-style-type: none"> <li>Figuring out explicitly and implicitly spoken important details in Biology.</li> </ul>	3	2 hrs. per a webcast
	Interpreting Cause & Effect	<ul style="list-style-type: none"> <li>Identifying causes and effects for the scientific statements of Biology.</li> </ul>	3	2 hrs. per a webcast
Critical Listening Skills	Evaluating	<ul style="list-style-type: none"> <li>Deciding between correct and incorrect scientific statements of Biology.</li> </ul>	3	2 hrs. per a webcast
	Comparative Analysis	<ul style="list-style-type: none"> <li>Categorizing scientific features within the context of Biology by matching differences with their categories.</li> </ul>	3	2 hrs. per a webcast
	Inferring	<ul style="list-style-type: none"> <li>Selecting the appropriate inferences within the context of Biology for the given scientific statements.</li> </ul>	3	2 hrs. per a webcast

### Treatment

Listening comprehension and critical listening webcasts were introduced in the second semester of the academic year 2020–2021. They were administered in six weeks starting from the 31<sup>st</sup> of March 2021 until the 11<sup>th</sup> of May 2021. Holidays were excluded. There were three days a week of three live webcasts for each listening skill so that there was one 2-hour webcast per day. For each webcast, there were five digital listening tasks (with listening excerpts ranging between 5 and 15 minutes) in addition to the extra listening resources recommended at the end of webcasts. Students were allowed to take

notes while listening and received corrective feedback immediately after their responses. Students attended the scheduled live webcasts in their locations outside the lecture class by using their own digital devices. Those live webcasts were archived for later playback so that students who needed a repetition to review, could watch the archived on-demand webcasts and perform the tasks again. Also, students had extra recommended listening resources for practice after the live webcasts to extend their practice time.

There were two formative assessment quizzes. There was one after the nine listening comprehension webcasts and the other one was after the nine critical listening webcasts. Those formative assessment quizzes were stereotypes of the final listening comprehension and critical listening tests and they aimed to check out students' internal mastery level so that unsuccessful students who had less than 90% in the formative quizzes, should review via on-demand webcasts and practice more via provided extra resources. Those formative assessment quizzes were performed online via students' own digital devices in the lecture class at the Faculty of Education or via Bluetooth share in case of internet data connection failure on students' own devices or via computers in the faculty's labs in case of unavailability of students' devices with minimum technical requirements for running the quiz. Unlike the listening tasks in the webcasts, students were not provided with correct answers for their incorrect responses nor allowed to review their responses. Thus, their

responses were just scored. Formative assessment quizzes’ results were uploaded and sent online via Webex Meetings application or tutor’ official university email. Some results were shared via Bluetooth or flash drives when there was breakdown in the internet connection.

## Results

To answer the third question, the hypotheses were statistically tested via the two English listening tests of listening comprehension and critical listening as follows:

Hypothesis One stated that “There is a statistically significant difference between the mean scores of the sophomore Biology majors’ English listening comprehension skills in the pre- and post-administrations of the listening test in favor of the post-administration”. The paired samples t-test was used to check this hypothesis. The following table shows the results related to the sophomore Biology majors’ listening comprehension skills:

Table (2) Paired Samples t-test value of the difference between the mean scores of the listening comprehension skills in the pre- and post-administrations of the Listening Comprehension Test

		N	Mean	St. Deviation	t	Significance
Hypothesis I	Pre-administration	58	9.741379	4.796052	-37.1	.000
	Post-administration		49.75862	6.684127		

Table (2) shows that there is a difference between the mean scores of the listening comprehension skills in the Pre-and Post-administrations of the listening comprehension test in favor of the post-

administration. The difference was statistically significant ( $t = -37.1$ ,  $p < 0.05$ ).

Hypothesis Two stated that “There is a statistically significant difference between the mean scores of the sophomore Biology majors’ English critical listening skills in the pre- and post-administrations of the listening test in favor of post-administration”. The paired samples t-test was used to check this hypothesis. The following table shows the results related to the sophomore Biology majors’ critical listening skills:

Table (3) Paired Samples t-test value of the difference between the mean scores of the critical listening skills in the pre- and post-administrations of the Critical Listening Test

		N	Mean	St. Deviation	t	Significance
Hypothesis II	Pre-administration	58	6.344828	2.537797	-28.2	.000
	Post-administration		40.96552	9.082402		

Table (3) shows that there is a difference between the mean scores of the critical listening skills in the Pre- and Post-administrations of the critical listening test in favor of the post-administration. The difference was statistically significant ( $t = -28.2$ ,  $p < 0.05$ ).

Hypothesis Three stated that “There is a statistically significant difference between the mean scores of the sophomore Biology majors’ overall English listening skills in the pre- and post-administrations in favor of the post-administration”. The paired samples t-test was used

to check this hypothesis. The following table shows the results related to the student teachers’ overall English listening skills:

Table (4) Paired Samples t-test value of the difference between the mean scores of the overall English Listening skills in the pre- and post-administrations of the two Listening Tests

		N	Mean	St. Deviation	t	Significance
Hypothesis III	Pre-administration	58	16.08621	5.348502	-44.6	.000
	Post-administration		90.72414	11.944011		

Table (4) shows that there is a difference between the mean scores of the listening comprehension and critical listening skills in the Pre–and Post–administrations of the two listening Tests of listening comprehension and critical listening in favor of the post–administration. The difference was statistically significant ( $t = -44.6, p < 0.05$ ).

Hypothesis Four stated that “Webcasting has a high positive impact on the target English listening skills among sophomore Biology majors”. The effect size ( $\eta^2$ ) was estimated to check this hypothesis. The following table shows the values of ( $\eta^2$ ) for the sophomore Biology majors’ listening comprehension and critical listening skills as well as the overall English listening skills:

Table (5) The Effect Size level of Webcasts on the sophomore Biology majors’ English Listening skills

Independent variable	Dependent variable	$t^2$	DF	$\eta^2$	Effect Size
Webcasts	Listening Comprehension skills	1,376.41	57	0.96	Large
	Critical Listening skills	795.24		0.93	Large
	Overall English Listening skills	1989.16		0.97	Large

According to table (5), Eta-squared was used to calculate the effect size of webcasts on the English listening skills among sophomore Biology majors. The effect sizes were large ( $\eta^2 = 0.96, 0.93$  and  $0.97$ ). Thus, webcasting had a high positive impact on the target English listening skills among sophomore Biology majors.

### **Discussion of results**

Sophomore Biology majors' listening skills were noticeably developed and their performance was highly and gradually optimized in the target listening skills due to some factors that were considered during the webcasting.

As for the organization factor, webcasts were well-organized. They were started by hooking students' attention on the key elements of online presentations via ILOs and overview for the target listening skill. They were also concluded by Q&A that allowed for students' inquiries and discussion of their learning difficulties.

For the clarity and precision factor, the webcasts were clear and concise since the presentation materials were screen shared with the students during the live streaming. Therefore, students performed the tasks and practiced listening smoothly and successfully. This is in line with the findings of Giannakos' and Vlamos' study (2013) that showed students' high performance when using educational webcasts that facilitated their comprehension.

Regarding the interaction factor, the interactive listening quizzes were embedded within the webcasts in order to assess students' performance in the target listening skill during the live and on-demand webcasts. Students' responses were automatically scored by the test application. Accordingly, students benefited much from the listening practice followed by the interactive quizzes as they received immediate corrective feedback for their incorrect responses. This highly agrees with Freguia's study (2017) which revealed webcasts' interactivity via engineering students' active participation with the learning material provided in the broadcasted online presentations.

From the perspective of the factor of meaningfulness, webcasts provided rationale for practicing the target listening skills in their start-up by making meaningful connection between the listening tasks and students' prior knowledge or previous experiences. Thus, students were convinced of practicing the target listening skills.

In case of the authenticity factor, webcasts were authentic as they presented real-life listening materials (audio & video) that were closely related to students' major field of study (Biology). As a result, these listening tasks were useful to the students as they replicated real-life experiences in the target listening skills. This result goes with Bouabdallah's research (2015) which indicated that providing authentic language materials reinforces students' practice of language skills in ESP classes.

In regard to the accessibility and flexibility factor, webcasts provided the recording option to the students during their live streaming. In addition, those real-time webcasts were automatically archived for later use and playback by students anywhere and anytime. Here, students were able to access the on-demand webcasts to view their missing webcasts or to review what they had learnt in the live webcasts. This is in line with Jones' study (2017) which confirmed the beneficial combination between live and on-demand webcasts for convenient and flexible use of learning materials. Also, this accessibility provided the opportunity to the unsuccessful students to optimize their performance in the target listening skill via repetition and frequent practice. This is in agreement with the research findings of Traphagan et al. (2010) which proved the optimization of students' performance via repeated viewing of webcasts.

On the side of the problem-solving factor, webcasts were periodically ended by Q&A to figure out the difficulties that students encountered during the live webcast. The webcaster attempted to overcome such problematic issues in the upcoming live webcasts successfully. Consequently, students were encouraged and motivated to continue practicing the target listening skills via webcasts. This goes in line with Siritarungsri's study (2011) that referred to Nursing students' outstanding performance owing to the online social communities constructed via webcasts as well as the study of Lust et

al. (2012) that showed students' persistence to continue use of educational webcasts as they perceived their usefulness.

In respect to the factor of abundance, webcasts were closed by providing recommended extra resources for further intensive practice of the target listening skills. Thus, students had the opportunity to enhance their performance in the target listening skills via extensive practice beyond the webcasts.

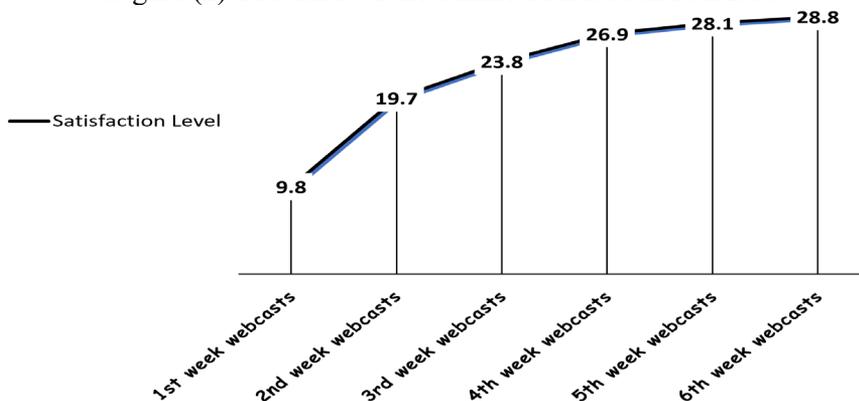
In conclusion, webcasting, as a proposed pedagogy, had a high positive impact on developing the English listening skills among sophomore Biology majors since it considered the factors of organization, interaction, clarity, precision, meaningfulness, authenticity, accessibility, flexibility, problem-solving and abundance in a way that allowed for students' useful, intensive and extensive practice of the target English listening skills within the context of Biology.

## **Qualitative data discussion of the two online Opinion Polls**

### **1. The Online Satisfaction Poll**

The Online Satisfaction Poll data were gathered and organized in a chart according to the average scores of students' satisfaction level of their weekly responses for every three webcasts related to each of the target English listening skills. Those responses were given in light of the 5-level continuum of agreement for each of the six statements underlying the poll question "How satisfactory are the webcasts for you?" as indicated in the following figure:

Figure (2) The Chart of the Online Satisfaction Poll Data



According to the satisfaction poll chart, the students' satisfaction level was getting higher weekly as they attended and got engaged with more webcasts for practicing English listening within the context of Biology.

As the total average score is 30, the first week showed the lowest satisfaction level (average satisfaction score = 9.8). To find out the reasons for their lowest satisfaction level in the 1<sup>st</sup> week live webcasts, students' discussions via Q&A in the webcasts' closure, were analyzed. Students' lowest satisfaction level may be due to one or more of the following reasons. First, webcasts' schedule did not suit most students. Second, the instructions were very short with insufficient details. Third, the extra resources were not enough for deeper practice. Fourth, some technical requirements were not supported in students' digital devices. These possible problems were avoided in the upcoming webcasts. The opinions of the majority of students were considered when scheduling the webcasts. Instructions of listening tasks were given in detail so that they were clearly

understood by all students. Web links were presented for websites, services and applications that provided updating and unlimited number of extra English listening resources within the context of Biology. Finally, the necessary software was shared with the students who had technical problems in order to help them run the live webcasts successfully on their digital devices.

Students' satisfaction level of the 2<sup>nd</sup> week was neither high nor low (average satisfaction score = 19.7); but it was higher than the first week as the first week's problems were resolved. When analyzing the students' discussions by the end of the 2<sup>nd</sup> week live webcasts, it was figured out that some students experienced problems in the internet connectivity in the form of lagging feed that slowed down and interrupted the live streaming occasionally. To solve such a problem, the webcasting videos and audios were encoded in video and audio formats that did not cause the lagging feed during the live streaming of webcasts.

In the 3<sup>rd</sup> week webcasts, there was a fairly increase (average satisfaction score = 23.8) in students' satisfaction level with the live webcasts. When analyzing the students' discussions by the end of the 3<sup>rd</sup> week live webcasts, this increase was due to solving the problem of lagging feed in the internet connectivity.

In the next three weeks (4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> weeks), more increase was clearly shown in the students' satisfaction level. Students' discussions of possible problems by the end of the live webcasts of the 4<sup>th</sup>, 5<sup>th</sup> and

6<sup>th</sup> weeks indicated that they enjoyed practicing listening via live webcasts as they became accustomed to practicing the target English listening skills via live and on-demand webcasts. They also claimed to experience much progress in their listening performance of the target skills since they made the best use of on-demand webcasts for reviewing and benefited much from the recommended extra listening resources.

The findings of this poll are in line with what Lust et al. (2012) reported in their study regarding the students' motivation to continue using the webcasts owing to their growing perception of the usefulness of webcasts adopted over time.

In conclusion, the sophomore majors of Biology at the Faculty of Education were satisfied with webcasts owing to the opportunities provided for them to:

1. Share their opinions while scheduling the webcasts.
2. Focus on the key elements of the listening practice tasks via ILOs.
3. Get a comprehensive overview for the target listening skill.
4. Understand the assigned listening tasks via clear and fully-detailed instructions.
5. Have a good deal of listening tasks that helped them practice the target listening skills successfully.
6. Practice listening skills during live webcasts and via authentic listening tasks that were meaningful for them as they were closely related to their major of Biology.

7. Discuss their problems by the end of live webcasts and solve them carefully for the upcoming scheduled ones.

## 2. The Online Usefulness Poll

The Online Usefulness Poll data, gathered in the table below, were organized according to the number of students who responded to the 5-level agreement continuum of each statement underlying the poll main question “How useful are the webcasts for practicing English listening within the context of Biology?”

Table (6) The Table of the Online Usefulness Poll Data

Statement No.	Number of Students who				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Nil	Nil	2	Nil	56
2	Nil	Nil	Nil	4	54
3	Nil	Nil	Nil	8	50
4	Nil	4	Nil	6	48
5	Nil	Nil	Nil	19	37
6	Nil	Nil	1	Nil	57

According to the table above, qualitative analysis of data was presented for six statements of the usefulness poll question in terms of the students' responses to each 5-level continuum of agreement.

Statement One stated “Webcasts provide sufficient listening tasks for the target English listening skill”. In this statement, just two students were Neutral about the sufficiency of the listening skills provided via webcasts. However, almost all students (96.5%) strongly agree (n=56) that they had practiced sufficient listening tasks within the context of Biology during live webcasting.

Statement Two stated “Webcasts’ listening materials are relevant to the specialized field of Biology”. Here, all students (agree= 4 & strongly agree= 54) confirmed that all the webcasted listening materials were closely related to their major (Biology).

Statement Three stated “Webcasts are interactive & encourage active leaning and engagement”. In this statement, all students (agree= 8 & strongly agree= 50) pinpointed their active role as autonomous language learners while practicing the target English listening skills via live and on-demand webcasts.

Statement Four stated “Archived Webcasts are helpful for reviewing & deeper practice”. In this statement, almost all students (agree= 6 & strongly agree= 48) asserted their need of repetition by accessing the archived webcasts to review what they had learnt and practiced during the live webcasts. However, a few students (n=4) disagree as they did not need to repeat what they had in the live webcasts since they managed to accomplish the target ILOs.

Statement Five stated “Webcasts’ closure allows for open and fruitful discussions via Q&A for learning difficulties and possible solutions to overcome them”. All students (agree= 19 & strongly agree= 37) found the webcasting closure helpful as it provides answers to their inquiries and solutions to the problems that they encountered while practicing listening during the live webcasts.

Statement Six stated “Webcasts provide extra resources that are adequate for more practice on the listening skill within the context of

Biology”. The vast majority of students strongly agree (n= 50) that the extra resources provided by the end of webcasts were beneficial for intensive practice on the target English listening skills in their specialized field of Biology.

In conclusion, the webcasts of English listening were very useful as they helped sophomore Biology majors practice the target English listening skills successfully by providing:

1. Sufficient English listening tasks that were authentic and relevant to the field of Biology as in Bouabdallah’s research (2015) that figured out the reinforcement of students’ practice via authentic language materials within the major field of study.
2. Live webcasts that were followed by archived ones as illustrated by Baecker et al. (2009) who pinpoint the importance of archived webcasts for more accessibility.
3. On-demand webcasts for reviewing what they had in the live webcasts. This is in line with the study that was conducted by Traphagan et al. (2010) which indicated the usefulness of repetitious viewing of the recorded live webcasts via on-demand mode in order to optimize performance level.
4. Discussions via Q&A for any problems that they had while practicing the target listening skills in order to avoid and overcome them in upcoming webcasts.
5. Extra recommended listening resources on the target listening skills by the end of live webcasts to extend their practice time.

This is in agreement with Vandergrift (2016) who confirm that listening is a complex process that requires frequent practice to develop.

6. Opportunity to get engaged with the listening materials via interactive quizzes.

According to the findings of the two opinion polls, webcasting had a high positive impact on their English listening skills within the context of Biology as it was satisfactory and beneficial to the sophomore majors of Biology at the Faculty of Education.

## **Recommendations and Suggestions**

### Recommendations

The following are the research recommendations:

1. Webcasting promotes students' deeper comprehension as it supports students' self-pacing and learning speed.
2. When developing English listening skills, Webcasts should consider the following:
  - a. Provision of abundant listening resources for extensive practice.
  - b. Archiving the live webcasts to enable students to review.
  - c. Incorporation of authentic materials within the target context of students' major field of study.
  - d. Students' interaction with the learning materials via interactive listening quizzes that provide immediate corrective feedback.
3. For a successful online teaching in higher education that considers the social distance measure among people during the pandemic of

COVID-19, webcasting can be used to enhance communication between the tutor and the students as well as among students in their locations.

### Suggestions

Here are some suggestions for possible further research:

1. The Effect of Webcasting on Students' Scientific EFL Reading Skills at Faculties like Dentistry, Science & Pharmacy.
2. The Impact of Webcasts on Improving the English Majors' Speaking and Writing Skills at the Faculty of Education.
3. Replicating the current study on:
  - a. Developing the English Listening Skills among Students of Chemistry and Physics at the Faculty of Education.
  - b. Enhancing the English Reading Skills among Students of Biology at the Faculty of Education.

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