A two-layered program for Teaching High School Graduates English for the Study of Physical Sciences will be provided by the Society of Pakistan English Language Teachers (SPELT) at its premises in Karachi, Pakistan. Being the first course of its kind, it will serve as a model for Science and English teachers. Therefore, it will be offered to twenty participants including high school science graduates as well as science and English language teachers. The course will focus on helping learners master English skills for comprehension of scientific terms and material, note taking during lectures, writing lab reports and making oral presentations. The content and materials for the course have been developed on the basis of the summer 2011 online ESP Best Practices course provided by the University of Oregon through the U.S. Department of State E-Teacher Scholarship program and the E-Teacher Professional Development Workshop conducted by the University of Maryland, Baltimore County (UMBC) 2012.

**Host:** The Society of Pakistan English Language Teachers

**Participants:** English language teachers and high school graduates

**Program:** A six-week program for English language teachers and high school graduates

**Schedule:** July 1, 2013 to August 15, 2013

**Goals:** At the end of the course participants will be able to:
- Recognize scientific terms and apply them;
- Apply reading skills for comprehension of scientific texts;
- Record the main points during a lecture;
- Employ speaking skills for class discussions and oral presentations;
- Write lab reports; and
- Use this course as a model for teaching English for Physical Sciences to future high school graduates.
Problem Identification
In Pakistan many students do not have adequate proficiency in English to be able to cope with studies in science subjects at the university level. This is because these students come from schools where, except in the compulsory English period, all teaching is done in Urdu, Pakistan's national language. Their proficiency in all the English language skills is minimal. Therefore, students who want to continue their studies at the university level in science face a major challenge. Because all teaching of science subjects at university level is totally in English, these students find it difficult to understand what is being taught because they lack receptive skills in reading and listening in the language. Their weak productive skills result in their inability to write lab reports or to give oral presentations. Because of this they feel frustrated and in spite of being good students, some even drop out. To be able to cope with their studies at the university and also to keep abreast with the latest developments in their subjects, these students need help to improve their language skills.

So far, there are no institutions that give English classes specifically geared for building language skills for the study of science. These aspiring university students need English for Specific Purposes; therefore more teachers trained in this area are required. This project proposes to provide training to English language teachers for preparing high school graduates for entering university and pursuing studies in scientific fields with minimal problems where English is concerned.

Contextual Analysis
I work for a volunteer organization by the name of The Society of Pakistan English Language Teachers (SPELT). The organization conducts several courses for students wishing to improve their proficiency in English as well for the professional development of English language teachers.

The training will be provided at the SPELT premises i.e. 101, First Floor, Plot No. C-28, Kh-e-Ittehad, Lane 12, Ph.2 Ext., DHA, Karachi, Pakistan. The building is located in a commercial area sandwiched between a residential area for high-income families on one side and a slum area on the other side.

This location is best suited for students from both kinds of areas. There is enough public transport available at this location for students who do not have private cars. There are two rooms reserved for training at the SPELT premises. Except for June and the last Saturdays of the months, at least one of these rooms is always available. Since SPELT is a volunteer organization with no funding or grants, there will be financial constraints in meeting the daily running costs due to the consumption of electricity and water; payment for telephone calls; and compensation to office staff for the extra work they will be doing as well as in providing materials and resources to the learners.

Learner Analysis
The learners are English and science teachers who want to get training for teaching English for Academic Purposes to recently admitted students entering the university. Although these are teachers who are currently or have been teaching in schools, colleges, and other institutions, they are not familiar with EAP for science. This will serve as a model course that they will be able to replicate after closely observing it.

The learners are also new high school graduates who plan to join or have already joined the university for further studies in a science subject. Most of these students belong to the lower middle class strata who did not have the means to pay for the more expensive private schools where English is the medium of instruction.

The information was directly derived from constantly dealing with students studying at the graduate level and from observations sought and obtained from content teachers at the universities.
Content Analysis
The content of the course will include methodology for
1. Improving the reading skills of the learners so that they will be able to read and comprehend information from text books, journals and articles.
2. Improving their listening skills so that students will be able to understand lectures and take notes.
3. Improving the oral skills of the learners so that they will be able to take part in class discussions as well as make oral presentations.
4. Improving the writing skills of the students so that they will be able to describe experimental procedures and write lab reports.
This content does not fall under any part of any curriculum as this is a totally new course that is being designed.

Pre-existing texts or materials that may be found at university and English teaching institutions’ libraries will be looked into. Reading material and videos that were provided during the e-course will be referred to during the designing of the course content. Some of these include:
• The Asian ESP Journal: http://www.asian-esp-journal.com/
• Purdue University Online Writing Lab (OWL): http://owl.english.purdue.edu/owl/
• Writing Guidelines for Engineering and Science Students: http://www.writing. engr.psu.edu/
• Oak Ridge National Laboratory Environmental Sciences Division: http://www.esd.ornl.gov/research/research.shtml
• Frank Potter’s Science Gems: http://www.sciencedems.com/
• George Mason University Department of Biology Writing Guidelines: http://classweb.gmu.edu/biologyresources/writingguide/index.htm
• NASA for Educators: http://www.nasa.gov/audience/foreducators/index.html
• Science Teachers’ Resource Center: http://chem.lapeer.org/
• Writing Exercises in Science: http://www.fauxpress.com/kimball/w/9.html
• ESL Independent Study Lab: http://legacy.lclark.edu/~krauss/toppicks/toppicks.html
• English for Specific Purposes: http://www.rong-chang.com/esp.htm
• Online English Language Center: http://oelp.uoregon.edu/

Acknowledgement: The above sites were provided by the instructor of the English for Specific Purposes Best Practices course offered by the University of Oregon summer scholarship e-course in summer 2011. This course was offered as part of the E-Teacher Scholarship program. Funding for the scholarship course was arranged by the U.S. Department of State.

Delivery Analysis
This course will be face-to-face and the materials developed will consist of activities and exercises to develop reading, writing, speaking and listening skills as well as the grammar and the rhetoric required in specific scientific fields. Reading material, websites and pod-casts will be supplied.

Teachers observing the class will be provided with an observation chart that they will fill in during the course, to learn and remember the various steps and special points.
Project Plan

The course is envisaged to be of 45 hours spread over six weeks, from July 1, 2013 up to August 15, 2013:

- October 12, 2012: A notice will be put up in the main lobby for the SPELT International Conference, inviting English language and Science teachers to attend a training course. The main features of the course and particulars of who should be approached for registration will be given in the notice.
- November 1, 2012: The working committee coordinators will draw up a program for the course starting on July 1, 2013. With the help of the SPELT Academic Committee, work on procuring materials will begin.
- March 15, 2013: The final shape of the project and schedule will be presented before the SPELT working committee for final approval and for making any suggested changes. Letters and fliers for the course will be sent to various schools to announce the start of this new course and get students to enroll in the program.
- April 30, 2013: The final list of participants will be drawn up and letters/emails will be sent to them. Registration of participants and collection of the course fee will be carried out throughout May of 2013.
- June 15, 2013: All materials for teaching, copies of handouts, and reference books in the library will be ready for use.
- June 31, 2013: The training room will be prepared with regards to the seating arrangements and the settings for OHP, screen, white board multi media etc.
- July 1, 2013: The course will begin and continue through to August 15, 2013.

Design

The program has two layers. The first is a course for high school graduates to enable them to learn science terms, follow lectures and take notes, comprehend and assimilate reading material, write lab reports and make oral presentations. The second part of the program is meant to provide a model for English language teachers so they learn to conduct similar EAP courses.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Content</th>
<th>Learning/Training Activity</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. By the end of the training Ss will be able to recognize and use scientific terms in the correct context.</td>
<td>List of terms for the specific science field and the context in which they are used</td>
<td>Individually Ss will match terms with the correct meaning/context. In pairs they will compare answers. They will use the terms in context, verbally or in writing.</td>
<td>Assessment will be formative Trainees will be observed and their output assessed</td>
</tr>
<tr>
<td>2. By the end of the training the Ss will be able to use mature reading skills.</td>
<td>Vocabulary, skimming, scanning, reading for details</td>
<td>Ss will try to find meanings of difficult words through context. Ss will skim and scan given texts for required information individually and will compare answers in pairs or groups, through questions multiple choice, true/false individually and then in pairs/groups.</td>
<td>Through observing the trainees and evaluating their work</td>
</tr>
<tr>
<td>3. By the end of the training Ss will be able to record the main points of a lecture.</td>
<td>Listening for general information and specific information</td>
<td>Ss will be provided pre-listening, while listening and post listening activities based on video or audio recordings.</td>
<td>Assessing their performance during the listening activities</td>
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<tr>
<td>4. By the end of the training session the Ss will be able to write lab reports (see below for enabling objectives)</td>
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| a) Ss will learn the main points/headings for lab reports | Objectives, apparatus, procedure, observation columns, graphs, inferences, precautions/sources of error | • Brainstorming for headings by participants.  
• Negotiating for a consensus for the sequencing of the headings.  
• Making a skeleton report.  
• Putting up the report template for sharing and peer correction. | • Through the amount and quality of participation in brainstorming as well in the remarks given about peers’ templates  
• Based on the template prepared |
| b) Ss will be able to prepare and label observation charts/columns for noting observations. | Writing headings with the required units | Divide participants into groups of four and have them scrutinize five observation tables provided to them for errors or omissions. Ss make observation table for a specific experiment. | • Through observing their input in the group activity  
• Assessing the accuracy of the observation table prepared |
| c) Ss will be able to write the description of an experimental procedure. | The passive voice  
The process approach for writing reports | • Ss will be given examples of sentences in active and passive voices.  
• Ss will use the process of induction to arrive at the meaning of the passive voice.  
• Ss, in pairs, will use the passive voice to verbally describe the steps for making their favorite food using first, then, after that, finally, last etc.  
• They will then write the steps. | Ss will be given several sentences from which they will select the ones in the passive voice  
Ss’ abilities to describe a procedure will be assessed on their performance in the writing activity |
| d) Ss will be introduced to the various kinds of graphs and will be able to write interpretations from them. | Pie, block and other graphs  
Prompt sentences for writing interpretations | Ss will be provided different kinds of graphs from which they will be asked to  
• draw information.  
• select the correct value from a multiple choice question.  
• write inferences from the given graphs in typical sentences.  
• make graphs from a given set of information | From individual performance in the various given activities |
<p>| e) Ss will be able to draw and write inferences from their observations, readings and graphs and write the final result. | Prompt sentences for writing the results of experimental procedures | Ss will be divided into groups of 3 or 4. They will be provided with experimental observations/readings and graphs and will have to select the correct final result from 4 options provided in each case. They will be asked to provide reasons for their selections. | Ss will be assessed on their performance during the activity stage |</p>
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<td>1) Ss will be able to write a holistic report on their experiments for an oral presentation of 8 minutes.</td>
<td>Writing paragraphs</td>
<td>Ss will be given the procedures, observation tables, graphs and asked to write a report on the experiment and its results taking care to mention the special precautions that needed to be taken.</td>
<td>On Ss' 8-minute presentations</td>
</tr>
</tbody>
</table>

Lesson/Activity Observation Sheet for Teacher Trainees

Date: 
Time: 
Main Aim: 
Sub Aim: 
Material/Activity used: 
Warm up/Grabbing Attention Activity: 
Preparation for Activity: 
The Presentation/Performance stage: 
Post/Retention Activity: 
Follow-up: 
Assessment/Evaluation Procedures: 
% of Teacher-talk time 
Comments on the Usefulness and Effectiveness of the Activity: 
Alternate materials/Activities that could be used for the same sub-aim: 

Rationale for Sequence

It is important that newcomer students preparing for the experience of learning science at the university level become familiar with scientific terms so that they do not misinterpret the terms when they read or listen to science texts. Reading skills in general are easier to develop among adult learners as they have been exposed to some reading in their daily lives as well as in compulsory English classes at school. Because these students have done very little listening to English, they will take time to recognize words and make sense out of sentences when they hear them. Since writing lab reports has many parts to it, it is intended that the second half of the day is set aside for writing. This means that writing will be taught side by side with reading and listening. It is believed that this sequencing will be effective as it keeps in mind the factor of necessity for learning scientific terms and also the graded system where the simpler skills are taught before the more complex.

Development

Sample Training Plan

(The Cambridge University has prescribed the format below for lesson plans. Every year SPELT conducts ICELT, a Cambridge certificate course for teachers. This format gives a quick idea of the stages of the lesson, the description of the time bound activities and their rationale.)

Objective: Students will be able to write a report describing a process.

<table>
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<tr>
<th>Stages</th>
<th>Time</th>
<th>Procedure/Activity</th>
<th>Skill in Focus</th>
<th>Stage Aim</th>
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<tr>
<td>Warm-up</td>
<td>3 min</td>
<td>• T asks Ss what they did last evening and whether they had any guests visiting them</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• T asks what they serve to guests who visit casually and tries to elicit ‘tea’</td>
<td></td>
<td>To have a relaxed stress-free atmosphere while the Ss are led towards the main topic</td>
</tr>
<tr>
<td>Pre-Writing</td>
<td>5 min</td>
<td>• The T has Ss brainstorm and writes the related words and ideas for making tea on the board</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• T revises sequence markers and the passive voice</td>
<td>Brain storming</td>
<td>To help Ss focus on the process of making tea and generate ideas and vocabulary</td>
</tr>
<tr>
<td>Writing first Draft</td>
<td>20 min</td>
<td>• T asks Ss to work individually to write the first draft of a paragraph</td>
<td>Writing</td>
<td>To help Ss organize ideas and write a report on the steps in a process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>describing the steps that were taken for making tea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self and Peer Editing</td>
<td>8 min</td>
<td>• T asks Ss to self edit their work</td>
<td>Writing</td>
<td>To have Ss look for spelling and grammatical errors. To peer edit and make meaningful suggestions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Next they peer edit their partners’ draft and give feedback/suggestions</td>
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<tr>
<td>Writing second Draft</td>
<td>12 min</td>
<td>• T asks Ss to write the final draft</td>
<td>Writing</td>
<td>To have Ss write a final draft incorporating worthwhile suggestions from peers</td>
</tr>
<tr>
<td>Follow-up</td>
<td>Home assignment</td>
<td>• T asks Ss to write a report on the process of making a paper kite</td>
<td>Writing</td>
<td>To have Ss recall class activity to write the process and thus enhance retention</td>
</tr>
</tbody>
</table>

In the next class the instructor will provide feedback to the whole group of participants for common mistakes or errors. Feedback on individual errors will be given in writing in the participants’ notebooks.

**Implementation Checklist**

*Items*
- Multi media
- Screen for viewing video clips etc.
- Over head projector
- Flip charts
- Flip chart stand
- White board with a duster/cleaner
- Colored markers
- Chart paper
- Apparatus for showing experiments
- Refreshments
- Crockery and Cutlery

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Tasks
- Photocopying handouts
- Setting tables with four chairs each around them
- Cleaning white board
- Having the generator in working order
- Making an attendance sheet

Evaluation
Formative assessment will be carried out throughout the training. On the last day of the course, participants will sit for a final summative test. The final score will be a measure of the level of proficiency in EAP (Science) that has been achieved by the participants. See below for details.

Assessment and evaluation of the writing:
The teacher T will be assessing and evaluating the students throughout the lesson. A more comprehensive assessment will be made by examining the final. At the warm-up and pre-writing stage the T will be able to judge the ability of the students to come up with ideas related to the topic. During the writing of the first draft, the teacher will be monitoring the input that each student is putting in and be able to assess the degree of ease or difficulty she/he has in organizing ideas on paper. The self and peer editing stage will provide the teacher the opportunity to assess students’ ability to look at and make meaningful corrections and suggestions to a written draft. Through the final draft the teacher will be able to evaluate the student’s use of sequence markers and passive voice for writing a report.