

## EXAMINATION OF THE FOUNDATION PROGRAM ENGLISH LANGUAGE AND INFORMATION TECHNOLOGY COURSE MATERIALS FOR CONTENT ALIGNMENT AND LINGUISTIC SUPPORT OF STUDENTS

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### ABSTRACT

*This paper reports on the results of a project conducted at the Centre for Preparatory Studies at Sultan Qaboos University as a part of a large scale study that explored transitional challenges of the Omani foundation program students. Acknowledging the claimed synergy of teaching and research (Prince, Felder & Brent, 2007), the authors are particularly concerned with linguistic, contextual and practical aspects of core text books and course materials currently in use at Sultan Qaboos University's foundation program English Language (FPEL) for Science Writing and Information Technology (IT) courses. They also focus on such aspect necessary for mitigating students' transitional challenges and enhancing their' learning performance and digital, linguistic and content literacies (Literacy for life, 2006), as the extent of the courses matching in terms of learning outcomes specified by the standards and reflected in materials used to address them. The findings of the project that utilized online software and tools for text analysis and text analytics suggest that the implementation of cross-disciplinary dialogue within the framework of the foundation program can be a workable solution to better respond to students' transitional needs and facilitate the process of their adjustment to a new educational environment.*

**Keywords:** transitional challenges, course materials, foundation program, Oman

### INTRODUCTION

The transition from school to university level study can be demanding and challenging. Similar to their peers around the world, young Omani students have diverse transitional experiences both positive and challenging due to a wide range of personal, cultural and academic situations, which are described in literature as “stressful social and psychological events” (Bernier, Larose, & Whipple, 2005). The transitional challenges can be related to a number of themes that include language issues, technology issues, issues with learning and content knowledge (Kong, Harmsworth, Rajaeian, Parkes, Bishop, Al Mansouri & Lawrence, 2016), socio-cultural issues relating to, or involving a combination of social and cultural factors (Sociocultural, 2017), such as, for example, social and cultural knowledge and skills connected to understanding of the university setting, getting to know the university, settling into the courses, learning what is expected of an individual as a student, discovering activities and social opportunities, making connections with teachers and making new friends (Your transition, 2017), adjusting to a new sociocultural and physical environment of learning at tertiary education level. In Oman, the environment of a tertiary education institution features, for example, a multicultural teaching and academic community, a coeducational system, a

change of the medium of instruction from Arabic to English in addition to use of teaching methods, tools, approaches, requirements to students' competences, skills and literacies that are different from what students were familiar with at school.

Literacy is a complex and dynamic concept that involves four discrete understandings: "literacy as an autonomous set of skills; literacy as applied, practiced and situated; literacy as a learning process; literacy as text" (Literacy for life, 2006, p.148). Literacy as an active and broad-based learning process is "no longer exclusively understood as an individual transformation, but as a contextual and societal one" (Literacy for life, 2006, p.159). According to Literacy for life report (2006), the most common understanding of literacy is "that it is a set of tangible skills – particularly the cognitive skills of reading and writing – that are independent of the context in which they are acquired and the background of the person who acquires them" (p.149). However, the word 'literacy' has begun to be used in a much broader, metaphorical sense, to refer to other skills and competencies, enabling access to knowledge and information (Literacy for life, 2006, p.150), and includes, for example, digital, content and linguistic literacies. Digital literacy is "the ability to find, evaluate, utilize, share, and create content using information technologies and the internet" (What is digital literacy, 2017). In view of Buckingham (2006), digital literacy is "much more than a functional matter of learning how to use a computer and a keyboard, or how to do online searches" (p.267). He further goes on to explain that a useful means of mapping the field can be provided by a basic conceptual framework that includes representation, language, production, and audience (Buckingham, 2006, pp.267-268). Content literacy is defined as the ability to use reading and writing for the acquisition of new content in a given discipline. McKenna & Robinson (1990) identify general literacy skills; content-specific literacy skills; and prior knowledge of content as three principal cognitive components of content literacy. Linguistic literacy is viewed as "a constituent of language knowledge characterized by the availability of multiple linguistic resources and by the ability to consciously access one's own linguistic knowledge and to view language from various perspectives" (Ravid, & Tolchinsky, 2002, p.419). Omani post basic school leavers joining public and private universities, according to Goodliffe (2010), often come from a language learning background that has relied largely on memorization and recall of information rather than analyzing and reflecting on the learning process (p.85). Many of them are insufficiently linguistically literate and struggle with using the English language effectively "throughout the range of social, personal, school and work situations" (Al Issa & Al Bulushi, 2011, p.1).

To mitigate students' academic transfer, improve their digital, content and linguistic literacies and learning skills, and help them better prepare for their upcoming specialization courses, the general foundation programs were designed according to Oman Academic Accreditation Authority (OAAA) standards. They were introduced in Oman's tertiary education institutions in 2010 with primary focus on student learning outcomes that places "the students and their potential contribution to society at the heart of higher education" (Oman Academic Standards for General Foundation Programs, 2010, p.4). The foundation programs have since been viewed as a pathway for Omani students into their future academic studies that are aimed at developing their literacy, numeracy, computing and learning skills (Carrol et al., 2009, p.10) in a "creative, co-operative and flexible environment in which students and staff can learn, grow and fulfill their potential" (Centre for Preparatory Studies, 2017, n.p.). This environment should also provide for an educational context that is cross-disciplinary in its nature presented in "a special form of rational communication in which the perspectives of two or more fields are brought into conversation" (Osmer, 1950, p.163). Firstly, it should use concepts, teaching methods, approaches and tools of higher education to create a perspective for students to be better prepares for further studies. Secondly, it should bring this perspective

in dialogue of such disciplines as the English language, mathematics and information technology.

Wangery and Mutwelli (2012), who explored students' transitional challenges, point out that "university entry all over the world provides students the opportunity to define and advance careers opportunities." They further go on to explain that "depending on their home environment and setting, the physical and social environment of the university is new, overwhelming and intimidating to some students" (p.41). One of the biggest challenges that currently most foundation program students in Oman face is learning a wide range of skills in a short time to deal with their course requirements ( Ginosyan & Tuzlukova, 2015).

## **CONTEXT**

The goal of the foundation program offered by the Centre for Preparatory Studies of Sultan Qaboos University, similar to other higher education providers in Oman, is to prepare admitted students for undergraduate level studies, enabling them to experience a smoother and more successful transition. This program is designed in the form of learning outcomes for English, mathematics, information technology and study skills. [<http://www.squ.edu.om/tabid/11949/language/en-US/Default.aspx>]. It features learning outcome-oriented curriculum, skills-based classes, General English (0120-0340) and English for Specific Purposes (0560-0603/0604) courses that emphasize writing skills and higher level thinking skills. The main support channels for all the areas of the foundation program include in-house materials, a Writing Centre, a Tutorial Centre, Computer Labs, e-learning courses on Moodle platform as a tool for day to day course communication, alternate mode of course materials' delivery, resource containing additional materials, exercises to develop skills required by the course and assessed elements of courses (Scully, 2007) (FPEL courses), students' handbooks, lab sessions for hands-on experience (IT courses).

While some courses are easier to cope with, others are more challenging because of the content and task complexity. To exemplify, at the Centre for Preparatory Studies, courses in the English language area of the foundation program are offered at 6 proficiency levels. English language courses are designed to help students become independent learners who are well prepared for their degree programs and the world of work. They are also aimed at extending students' linguistic literacy, as well as their content literacy and skills to enable their active participation in further studies at higher education level. For example, it is presupposed that "having successfully completed English language component of the general foundation program a student will be able to satisfactorily: a) actively participate in a discussion on a topic relevant to their studies by asking questions, agreeing/disagreeing, asking for clarification, sharing information, expressing and asking for opinions; b) paraphrase information (orally or in writing) from a written or spoken text or from graphically presented data; c) prepare and deliver a talk of at least 5 minutes; use library resources in preparing the talk, speak clearly and confidently, make eye contact and use body language to support the delivery of ideas, and respond confidently to questions; d) write texts of a minimum of 250 words, showing control of layout, organization, punctuation, spelling, sentence structure, grammar and vocabulary; e) produce a written report of a minimum of 500 words showing evidence of research, note taking, review and revision of work, paraphrasing, summarizing, use of quotations and use of references; f) take notes and respond to questions about the topic, main ideas, details and opinions or arguments from an extended listening text (e.g. lecture, news broadcast); g) follow spoken instructions in order to carry out a task with a number of stages; h) listen to a conversation between two or more speakers and be able to answer questions in relation to context, relationship between speakers, register

(e.g. formal or informal); i) read a one to two page text and identify the main idea(s) and extract specific information in a given period of time; j) read an extensive text broadly relevant to the student's area of study (minimum three pages) and respond to questions that require analytical skills, e.g. prediction, deduction, inference" [Learning Outcome Standards posted at SQU, Foundation Program website <http://www.squ.edu.om/fp/tabid/9035/language/en-US/Default.aspx>].

The Foundation Program English language Writing Course for Sciences (FPEL Science) is one of those intense courses that require an array of linguistic, digital and content literacies and study skills to deal with the main writing task, namely the 500-word research report. Students are required to write a research-based report on a topic related to the field of their study. This project consists of such procedures, as choosing a topic, researching it, selecting sources, annotating them and taking notes, summarizing, synthesizing, paraphrasing and citing, writing and typing the report. The whole process involves intense application of specific course-related writing, study and computer skills. To help students cope with the task and facilitate the process of learning, the course offers students a wide range of resources on four major platforms to build up a set of specific language, study and computer skills to accomplish the task: face-to face instruction, weekly discussion forums on Moodle, Google docs and educational trips. Thus it focuses on specific language and study skills, while the Introduction to Information Technology course aims at ensuring that the students are equipped with the basic knowledge and necessary skills of computers to meet the cognitive and practical requirements of the degree program in a variety of disciplines. It is an English medium for all students whose courses will be conducted in English tailored to give students an introduction to computer theory and the basic skills needed for university. It covers such topics, as the theory of computing, basic computer operation and management, networking and Internet and main MS Office package component. Unfortunately, despite this two-facet effort, students can easily understand the content of the IT class, if it is explained in Arabic since their knowledge of general English and computer and internet terminology is limited. As observed by the foundation program teachers, first word-processed drafts of the writing report of some students in the FPEL Science Writing Course clearly show that they lack adequate language, IT and computer skills (e.g. report formatting, spell checking, including pictures/tables/graphs, preparing proper slides for presentation, moving slides back and forth, explaining terms like column, rows, etc., effectively using search engines for information, etc.). As well as that, although many students manage to score satisfactorily on their final reports, it seems obvious that a great number of them still fall short of the required standards for academic writing, study and basic computer skills. Consequently, students' inadequate literacies and skills are constructing multiple barriers in achieving their course goals. Moreover, the lexis and topics of the Introduction to Information Technology course do not seem to be covered in the language courses they are taking in the foundation program.

## **THE PROJECT**

This project was an attempt to look into the cross-disciplinary aspects of the foundation program English language and IT course materials with a focus on their lexical and content alignment using online utilities and software for text analysis, text mining and text analytics. Broadly speaking, it addressed the question put by Mark Warschauer (2002) in his seminal article on developmental perspective on technology in language education about whether technology is "a tool for language learning, or language learning is a tool so that people can access technology" (p.455).

The aim of the project was to examine core textbooks and course materials currently in use at Sultan Qaboos University's Foundation Program English Language for Science Writing and

Information Technology courses in order to help students better adjust to the new educational environment. The study was organized and interpreted in the framework of the following research objectives: (a) analysis of the content (e.g. covered topics and themes) of the FPEL Writing and IT courses; (b) examination of the software that is now successfully used for the quantitative and qualitative analysis of language corpora; automatic indexing of the linguistic texts, key words/phrases search, contexts and frequency of keywords/phrases analysis; (c) preparation of the corpora utilizing soft copies of the teaching materials currently in use in the FPEL Writing and IT courses (including deleting all images, graphs, tables etc.), and conducting their numerical and frequency analysis; (d) compilation of frequency and topic/themes list to compare and contrast them, and identification of their similarities and differences; (e) brainstorming of a list of principles that will have a major influence on the design of the teaching materials for FPEL Writing and IT courses; (f) conducting preliminary revision of the core textbooks and teaching materials for both courses, and preparation of recommendations for material designers and suggestions for materials' alignment to contribute to students' skills enhancement and smoother adjustment to the foundation program.

Acknowledging the claimed synergy of teaching and research (Prince, Felder & Brent, 2007), the project was particularly concerned with methodological, contextual and practical perspectives and factors, including the interrelations of these components and the extent of their matching in terms of learning outcomes specified by the standards and reflected in materials used to address them. The applied methodology was based on the recent progress in software and tools for text analysis, text mining and text analytics, as well as use of the innovative software and algorithms that brought dramatic changes into the traditional research landscape in language education and material writing and design (Baranov, 2001) thus contributing to innovative statistical projects and analysis of language functioning in different contexts and areas of discourse.

The research objectives employed (a) the creation of two electronic archives (collections of textual documents of FPEL Writing and IT courses textbooks) in machine readable form for searching for word entries in textual documents, creating frequency lists and structuring linguistic materials, matching words and phrases, etc.; (b) use of software for text analysis, text mining and text analytics (e.g. Word Tabulator [<http://www.rvb.ru/soft/index.html>]; cloud based Online Utility-Text Analyzer [<https://www.online-utility.org/text/analyzer.jsp>]; Word Frequency Counter [[http://www.writewords.org.uk/word\\_count.asp](http://www.writewords.org.uk/word_count.asp)]; Text Analyzer [[textanalyser.net](http://textanalyser.net)]; Write Words Phrase Frequency Counter [[http://www.writewords.org.uk/phrase\\_count.asp](http://www.writewords.org.uk/phrase_count.asp)]; Online Word Counter [<http://www.textfixer.com/tools/online-word-counter.php>] to convert unstructured text data into meaningful data, identify words' and phrases' usage and frequency, and evaluate to what extent the vocabulary used in the FPEL Writing and the IT course books and materials match. For example, the analysis utilized a Word Tabulator software. It is a quite simple tool for indexing and tagging texts identifying the lexical density of the textual documents and frequency of occurrence of any of the tokens (morphological forms) within the analyzed textual documents. This software was supported by the Text Analyzer online service on [textanalyser.net](http://textanalyser.net) that allows entry of text or a website. It also displays readability analysis, including reading level, sentence length and word counts. This tool acted as an instrument to operationalize the research objectives related to matching and statistical relationships between words and word classes, and, consequently, describing the extent of our students' language proficiency that can help them cope with the IT component of the foundation program.

## RESULTS AND DISCUSSION

The results of the study reveal that the Foundation Program English Language Writing and IT courses generally match in terms of learning outcomes specified by the standards and reflected in materials used to address them. However, there are certain differences in topics and themes covered in the courses of the English language and Information Technology areas of the Foundation Program. For example, in the IT course the students are introduced to such topics, as Computer Fundamentals Theory, Basic Operations and File Management, Word Processing, Spreadsheets Using MS-Excel, Presentations Using MS-Power Point, Computer Network and Internet. As Halliday and Martin (1993) contend, the language of science is a linguistic construal of experience and, by its nature, a language in which theories are constructed; its special features are exactly those which make theoretical discourse possible. Consequently, the Foundation Program English Language Writing and IT course differ in both lexical density and lexical diversity, and this may hinder students' progress and lower the chances of mitigating their transitional challenges.

In Johansson's (2008) view, lexical density relates to describing the proportion of content words (nouns, verbs, adjectives, and often also adverbs) to the total number of words. Lexical diversity is the term used to describe the multidimensional feature of lexical richness. As for the lexical density that is considered to be a useful measure of the difference between texts (Lexical density, 2017), the collection of the analyzed textual documents included both lexical words which carry meaning and information (e.g. nouns, verbs, adjectives and adverbs), and grammatical words (e.g., conjunctions, prepositions, articles, auxiliary verbs, some adverbs, determiners, and interjections that bind the texts together). The analysis of the general lexical density allows to observe some differences of the FPEL Writing course book and IT course book in number of characters (including number of words, lexical density, and number of sentences (See Table 1 for more information).

**Table 1. Lexical density of the FPEL Writing course book and IT course book**

	<i>FPEL Writing course book</i>	<i>IT course book</i>	<i>Observations</i>
Number of characters (including spaces)	153695	183492	IT course book is longer
Number of sentences	2308	1684	English Writing course book is richer
Number of words	22296	30426	IT course book is longer
Lexical Density	14.3479	10.9840	English Writing course book is more challenging

The analysis clearly demonstrates that there is obvious lexical diversity in the FPEL Writing course book and IT course book that provides important insights into both of them. One of the insights is that the lexical diversity of both course books is very high and the same words and phrases are not very often repeated. Therefore, both course books are rich in their lexis with most frequent words and phrases being different in the FPEL Writing course book and IT course book. For example, the list of twenty most frequent verbs in the FPEL Writing course book includes such lexemes, as 'use', 'have', 'retrieve', 'find', 'look', 'do', 'write', 'make', 'paraphrase', 'think', etc., whereas the IT course book features such high frequency verbs, as 'use', 'select', 'want', 'create', 'type', 'add', 'insert', etc. The study also reveals that the Foundation Program English Language for Science Writing course book is denser and hence, more challenging: simplification of language is recommended. Frequencies of most words and phrases are different.

As for the Information Technology course book, it has been identified that it contains a lot of specialized computer and information technology terminology (e.g., file management, word processing, computer network, etc.) that constructs the basis of the course and designates processes and phenomena related to computer and information technologies, their essential features and attributes. Hence, a variety of task types requiring knowledge of this terminology need to be integrated into the foundation program English language area curriculum. As well as that, explicit teaching of vocabulary, for example, top 20 lexical words that carry meaning is recommended. In addition, common concordances and collocations should be generated and included in the textbooks for practice.

Indeed, the foundation program is an excellent means of providing Omani school leavers' induction to the academic environment of tertiary education and ensuring their transition from Arabic medium school to English medium university. It also has the potential to provide students with valuable learning experiences that will enhance their digital, content and linguistic competencies, and study skills. However, inadequate language, computer and information technology skills are still hindering students' progress in their course work. To illustrate, many foundation program students demonstrate a level of general content and digital literacy that is insufficient for the English language courses' tasks and activities, and need improvement in word-processing, formatting, typing, editing, online information search skills, and such essential study skills' habit as use of online resources for academic purposes. On the other hand, insufficient English language proficiency hinders students' progress in their information technology classes, and adds to students' challenges, creating stressful and negative situations within the classroom. The results of the study clearly demonstrate that the implementation of cross-disciplinary dialogue of the faculty representing the English language and information technology areas of the foundation program, and blended learning approach applied to the practice of using both online and in-person learning experiences when teaching students (Blended learning, 2017) can be some of workable solutions to engage students in course-specific tasks that require intense application of language, study and computer skills, and, consequently, improve their literacies and contribute to their adjustment to university life. These solutions will give students more opportunities to apply a skill set in a more balanced and effective way, and promote a positive teaching and learning environment in which students feel more comfortable and gain confidence which is essential for foundation program students' smooth transition.

Oman's higher education sector and foundation programs, in particular, need to be better prepared in order to meet the adjustment needs of the students, and provide a suitable support for their learning, performance and mitigating their transitional experiences. The individual experiences of Omani foundation program students during their transition from school to higher education include challenges related to a number of themes, such as socio-cultural issues that involve a combination of social and cultural factors, e.g., social and cultural knowledge and skills related to understanding the university setting, getting to know the university, settling in to the courses, learning what is expected of an individual as a student, discovering activities and social opportunities, making connections with teachers and making new friends; language issues, technology issues, issues with learning and content knowledge.

## **CONCLUSION**

The project reported in this paper is an attempt to look into the cross-disciplinary aspects of the foundation program English language and IT course materials from the perspective of students' transitional challenges, including the need for optimizing lexical, grammatical and content alignment of core teaching materials. From the results of the project, as well as

current discussions, critiques and inquiries into the experiences and practices of the foundation programs' standards, management, administration, materials and curriculum design and development (Al-Busaidi & Tuzlukova, 2013), it is clear that more alignment of content, task complexity and learning outcomes in English, Math's, IT and study skills is needed. All the areas of the foundation program should address students' learning needs and contribute to their academic growth and development. They should also focus on students' common transitional challenges and take into consideration the hidden relationship between the English language (writing and study skills) and IT learning outcomes and curricula implementation. Aligning learning objectives and teaching materials will have a positive impact on the implementation of the foundation program curriculum for both the English language and IT components. It will also lead to the enhancement of collaboration of the educators within the foundation program, and, consequently, facilitate students' learning. This will be significant for students' better adjustment to university life and overcoming their transitional challenges.

### ACKNOWLEDGEMENTS

The authors would like to express their gratitude to the Deanship of Research and the Centre for Preparatory Studies at Sultan Qaboos University for their support of the project.

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