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Active Learning for Omani At-Risk Students through Educational Technology: A Case of Content-Based Language Instruction

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Abstract

In recent decades, content-based instruction (CBI) has been increasingly used worldwide with the aim of developing students' English language competency, particularly in their area of specialization. However, its implementation has not been without problems, and researchers have been seeking and suggesting ways to solve them. In this vein, this research describes the development and implementation of restructuring the teaching materials of General Foundation Programme courses (basic and applied mathematics modules) in Oman by using active learning through educational technology. The suggested restructuring of the teaching materials has two elements: 1) reorder the presentation of the course content for teaching specific learning outcomes within the context of broad conceptual themes; 2) incorporate active learning through technology and collaborative learning into every lecture. The new instructional design was assessed by a student survey and the comparison of their exam performance across three semesters in the academic years 2018-2020. The restructured courses significantly improved at-risk student engagement and satisfaction and increased academic performance.

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1. Introduction

For many years, within various research trends and educational contexts, researchers and teachers have been interested in exploring how they can help learners to learn language and content simultaneously. The concurrent study of language and content, referred to as content-based instruction (CBI), can occur in miscellaneous models, including sheltered instruction, theme-based courses, and adjunct models. However, all share several features, such as focusing on relevant subject matters, contextualization of language via content, and developing academic language proficiency (Jourdenais & Shaw, 2005). In the same vein, the General Foundation Programme (GFP) in Oman employs CBI intending to prepare students for postsecondary and higher education levels. Constituting from a set of disciplined programs, GFP is offered by the country's authorized higher education institutions in Oman (Tuzlukova et al., 2019).

A considerable issue regarding each program is the effectiveness of teaching which can be reflected in the attitudes and performance of the students. Considering effective teaching as a major contributor to the students' acquired knowledge, employability (Sivaraman et al., 2014), and valued outcomes (Dill, 2007), teachers need to be reflective and critical practitioners committed to promoting and maintaining high educational standards (Thomas, 2003). Accordingly, of particular concern is the traditional lecture-based courses within the GFP.

A traditional lecture course might be good for efficiently delivering a large body of content to many students. However, the traditional lecture format of GFP courses has many challenges for teaching and learning. It often leads to passive and superficial learning, and also, it cannot stimulate student motivation, confidence, and enthusiasm (Armbruster et al., 2009). Furthermore, the traditional lecture format would not help GFP students, particularly at-risk students, to gain the important skills they need to pursue their undergraduate education.

Over the past two decades, there have been several reports and articles calling attention to the need for changes in teaching methods for university education in order to promote meaningful learning, critical thinking, and problem-solving for students (Boyer, 1998; Handelsman et al., 2004; Rogaten et al., 2019). There is particularly a remarkable call to use student-centered instructional strategies like active- and collaborative- learning through education technology in the classroom (Bray & Tangney, 2017; Lahann & Lambdin, 2014; Seymour, 2002).

Active learning differs from the traditional lecture, where learners passively receive information from the educator. Active learning is bringing any instructional strategies into the classroom in order to engage students in the learning process. In other words, for active learning, students must do meaningful learning activities and think about what they are doing (Prince, 2004). From another perspective, active learning can be further elaborated through the concept of multi-sensory education, put forward by Montessori (1912), where multiple senses are harnessed at a time for effective teaching (Auer, 2008). Multi-sensory teaching holds the major premise that engaging students' auditory, visual, and kinaesthetic senses at the same time helps them to get involved in the activities; otherwise, the acquired knowledge would perish instantly (Baines, 2008). Moreover, collaborative learning can be defined as bringing any instructional methods into the classroom in which students work together in groups toward a goal (Scager et al., 2016). Educational technology is to facilitate learning and improves academic performance by using and managing appropriate technological processes and resources (Driskell et al., 2011). Accordingly, we believe that by using technology, we include more senses in education, do more real-life activities, and promote group work, which in turn, lead to better learning.

The educators who teach at-risk students must use a variety of teaching methods because these students are considered to have a higher probability of failing academically or dropping out of school. That is why higher education institutions have regularly asked educators to change their teaching approaches and use student-centered pedagogies such as active learning and educational technologies to promote meaningful learning, problem-solving, and critical thinking for them. The most common concern shared by educators of GFP modules is that students have poor attitudes toward their learning process. This kind of attitude leads to poor academic performance.

Hence, this study proposes an instructional design that restructures teaching materials of the GFP basic and applied mathematics courses in order to bring active- and collaborative-learning through educational technology into the classroom. This research is motivated by the deficiencies of the traditional lecture-based GFP modules and the findings of the research discussed in Armbruster et al. (2009). This research hypothesizes that restructuring teaching materials of the basic and applied mathematics modules in a content-based approach in GFP based on active- and collaborative- learning through educational technology improves at-risk student attitudes and academic performance.

2. Theoretical Framework

2.1. Content-Based Instruction

CBI is a pedagogical approach that addresses both language- and content-learning objectives, and leads students to work toward learning both at the same time (Spenader et al., 2018). In other words, CBI models "make a dual, but not necessarily equal, commitment to language and content learning" (Grabe & Stoller, 2019, p. 13). The underlying assumption of the CBI, based on Snow and Brinton (1988), is that the students' motivation will increase due to the relevance of the content to the students' academic and professional needs. Moreover, the contextualization of language through content makes the teaching of the language veer beyond the abstract and be mingled with more concrete concepts of the content area leading to the provision of comprehensible inputs (Echevarria & Graves, 2003).

The principles of CBI have their roots in those of the communicative approach to language teaching since they involve students actively in the exchange of content (Villalobos, 2014). According to Richards and Rogers (2005), language learning is more successful when language is used as a means of acquiring knowledge rather than as an end. Given that authentic language learning occurs in a context, CBI provides the context for meaningful and purposeful communication to happen (Lightbown & Spada, 2006; Stoller & Grabe, 1997). In the same vein, Kennedy (2006) believes that since the brain seeks patterns, providing the brain with relevant content leads to more successful learning and retention.

To date, several studies have tested the efficacy of the CBI. While some have confirmed its effectiveness (e.g., Grabe & Stoller, 1997; Snow & Brinton, 1988; Tsai & Shang, 2010), others reported some systematic problems, including a lack of extensive opportunities for language use in teaching and testing technical fields (Lee et al., 2013; Siu, 2021) and lack of overall motivation among students (Siu, 2021). For example, in a recent study, aimed at enhancing students' English language skills within the science and engineering curriculum, Siu (2021) demonstrated, through a self-reported survey, the promotion of the respondents' general confidence in using English for learning the subject matter. However, he noted problems in speaking and writing fluency as a result of deficiencies in vocabulary and grammar. Moreover, he found that the students' motivation for language learning was highly instrumental.

Various studies have proposed different CBI course redesigns to minimize the problems; nonetheless, the extent to which the problem of at-risk student attitudes and academic performance is facilitated by the application of active learning through educational technology is still unclear. The next section gives a brief review of the related empirical studies.

2.2. Active Learning through Educational Technology

Several studies have investigated the effectiveness of employing active- and collaborative- learning and educational technology in teaching. For example, Prince (2004) examined the effectiveness of active learning in engineering faculty. He found that there is broad support for the elements of active, cooperative, collaborative, and problem-based learning. Armbruster et al. (2009) developed and implemented an instructional design that brings active learning and student-centered pedagogies to an undergraduate introductory biology course for both majors and nonmajors. Their suggested course design significantly improved self-reported student engagement and satisfaction and increased academic performance.

Several researchers have investigated the effect of internet technology on the teaching and learning of mathematics. For example, Orcos et al. (2016) carried out a study on math students of a school in the Principality of Asturias that examined the effectiveness of online collaborative learning techniques through a Google-based environment. Their results showed that online collaborative activities had a positive effect on student satisfaction and academic achievements. Orcos et al. (2016) discussed the influence of technology on the teaching and learning of mathematics and the ways instructors can enhance the development of students' mathematical capacities.

To the best of the authors' knowledge, no previous work brings active- and collaborative-learning through educational technology into the content-based language classroom by restructuring the teaching material of math courses, so this work fills this gap.

3. Methodology

3.1. Participants

The participants in this study were recruited from the students of business and information technology (IT) who have enrolled in the GFP basic and applied mathematics modules. They were 120 students (74 males and 46 females) ranging from 18 to 22 years of age. They participated in the study according to their willingness to take part and were assured of the confidentiality of their information.

3.2. Study Design

The teaching materials for both the basic and applied mathematics modules were restructured in a way that active learning through educational technology can be implemented in each lecture. These GFP modules are one-semester courses that typically enroll between 100 and 150 students. The courses were redesigned to emphasize active learning through educational technology. One of the authors taught the course in the two academic years (AY) of 2018 and 2019. The at-risk student attitudes toward the courses were assessed by comparing scores on college-administered course evaluations for questions that addressed student satisfaction. These questions used both free-response questions and Likert-scale. The student performance was assessed by comparing the class scores on the three exams administered in 2018 and 2019.

3.3. Course Description

The basic and applied mathematics modules are required for GFP students in the first and the second semester, respectively. The modules focus on the basic applied mathematical skills such as a) solving and sketching two variables linear, quadratic, logarithmic, exponential equations, and inequalities; b) solving simple real-life problems; c) understanding basic concepts of descriptive statistics. Although we modified the order of the teaching materials, the core course content was not changed as a part of the instructional design. The mathematics lectures consist of two 120-min periods per week. Traditionally, the lecturers handed out a set of activities for each lecture in order to guide students in their assigned lecture notes, and discussion in recitation often cantered on these activities. Before the course revisions, the course assessments consisted of a test and a final examination. As a part of this course revision, the assessment plan was modified to include eight weekly quizzes for formative feedback, a midterm, and a final exam. In the course revision, all students were required to do three library activities which were assessed and evaluated separately from the lecture portion of the course.

3.4. Course Redesign

The course redesign consists of two major stages:

1. Reorder the presentation of the course content. We restructured the course so that the learning outcomes of the course will be taught within the context of broad conceptual themes. For example, a new lecture on function in the real world was presented before a series of lectures demonstrating an understanding of the definition of a function and its graph. This lecture was designed to help students solve real-world problems involving relations and functions. Another two lectures were presented on quadratic functions to help students solve real-life problems related to quadratic functions. This leads the

students to learn more about the shape of the graph and other elements needed to draw it. We also added a lecture that discussed the real-life problems in exponential functions. This lecture helps students to understand the need to solve exponential functions and the relationship between simple and compound interests. We finished the course by adding a lecture showing some examples of descriptive statistics in everyday life. In this lecture, we emphasized the vital role of descriptive statistics in real-life problems. The course syllabuses can be requested from the corresponding author.

2. We incorporated active learning and collaborative learning through technology into every lecture. In the first lecture, students were asked to organize groups of four or five members and sit together during the whole semester. They also communicated using the WhatsApp group they had created in the first lecture. In every lecture, a set of learning outcomes were displayed on the PowerPoint slides and discussed with the groups. Mathematical problems were also presented on a PowerPoint slide, and the groups worked on the problems promptly. The examples of a mathematical problem are:

    a. Problem 1: in a medical experiment, 100 is the number of bacteria present at the start of the observation, and 350 is the number present after five days. Find the growth rate of the bacterial population.
    b. Problem 2: the length of a rectangular car park is two times as long as its width, and the parking area is $1800m^2$. Find the length and width of the car park.

    The groups would use the internet through their smartphones to find vocabulary terms if they encountered difficulty. The instructor moved from group to group in the classroom in order to monitor the learning progress and offer suggestions to a group that faced difficulty. The selected group representatives would solve the problems for the class.

3.5. Assessment of Attitudes and Student Performance

We assessed student attitudes toward the courses in three semesters (i.e., S1 2018-2019; S2 2018-2019; S1 2019-2020) by a module evaluation survey administrated by the college. The survey used a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Additionally, we used the students' exam results at the end of the three semesters to compare student performance. To analyze the collected data, we used a two-tailed t-test for paired samples with a significance level of .05.

4. Results

4.1. Student Attitudes

Table 1 and Table 2 show the descriptive statistics and the paired samples test results of the students' responses to the module evaluation survey for S1 2018-19/S1 2019-20 and S2 2018-19/S1 2019-20, respectively. As Table 1 shows, there are significant changes in the students' attitudes regarding the module materials, organizing module handbook, learning activities in the class, the IT resources and facilities, and the feedback satisfaction ($p<.001$).

Table 1

Descriptive Statistics and the Paired Samples Test Results Regarding Student Attitudes for S1 2018-2019 and S1 2019-2020

Question	Descriptive Statistics				Paired Samples Test		
	Mean		Standard Deviation		t	df	Sig. (2-tailed)
	S1 2018-19	S1 2019-20	S1 2018-19	S1 2019-20			
A) The module handbook was organized in a way that helped me in my learning.	3.06	4.20	1.47	1.04	5.93	119	.000

B) The module materials were clear and up-to-date.	3.12	4.18	1.44	1.01	5.68	119	.000
C) The learning activities in the class/lab sessions have helped me to understand the lessons.	3.18	4.25	1.44	.93	5.88	119	.000
D) The IT resources and facilities were available for this module.	2.99	3.97	1.39	1.21	4.99	119	.000
E) I was satisfied with the range of oportunities available to obtain and use feedback to support my learning.	3.06	4.17	1.40	1.03	6.04	119	.000

As can be seen in tables 1 and 2, all figures for student attitudes indicate that student satisfaction is significantly higher in S1 2019-2020 than in S1 and S2 2018-2019 ($p<.01$). Hence, there is strong evidence that the changes we implemented in S1 2019-2020 improved student attitudes toward the courses.

Table 2
Descriptive Statistics and the Paired Samples Test Results Regarding Student Attitudes for S2 2018-2019 and S1 2019-2020

Question	Descriptive Statistics				Paired Samples Test		
	Mean		Standard Deviation		t	df	Sig. (2-tailed)
	S2 2018-19	S1 2019-20	S2 2018-19	S1 2019-20			
A) The module handbook was organized in a way that helped me in my learning.	3.31	4.20	1.37	1.04	4.71	119	.000
B) The module materials were clear and up-to-date.	3.65	4.18	1.18	1.01	3.16	119	.002
C) The learning activities in the class/lab sessions have helped me to understand the lessons.	3.63	4.25	1.23	.93	3.74	119	.000
D) The IT resources and facilities were available for this module.	3.41	3.97	1.25	1.21	2.93	119	.004
E) I was satisfied with the range of oportunities available to obtain and use feedback to support my learning.	3.60	4.17	1.17	1.03	3.37	119	.000

4.2. Student Performance

Table 3 provides t-test statistics for exam results in the three semesters. Student performance on the exams was greater in S1 2019-2020 when the students were taught the redesigned courses compared to the other semesters (i.e., S1 & S2 in AY 2018-2019). As can be seen in Table 3, there are significant changes in the figures for basic math comparing S1 and S2 in AY 2018-2019 with S1 in AY 2019-2020 ($p<.05$). Like those of the basic math, the changes in the figures of applied math are significant ($p<.05$).

Table 3
Paired Samples Test Results for Exam Scores in the Three Semesters of the S1 2018-2019, S2 2018-2019, and S12019-2020

	Basic Maths				Applied Maths			
	S1 2018-19	S1 2019-20	S2 2018-19	S1 2019-20	S1 2018-19	S1 2019-20	S2 2018-19	S1 2019-20
Mean	47.15	54.89	48.84	54.89	42.30	48.70	44.37	48.70
df	119		119		119		119	
t	1.99		2.30		2.1		2	
Sig. (2-tailed)	0.04		0.02		0.03		0.04	

5. Discussion

A traditional lecture format in a GFP introductory module often emphasizes content. However, it usually fails to convey to at-risk students the nature of being an independent learner. In addition, it may diminish learning outcomes and may negatively affect talented students at the GFP level. Accordingly, the main hypothesis of this research is that improving at-risk student attitudes would improve the students' academic performance. Therefore, this research proposes that restructuring the teaching materials of introductory mathematics courses based on active learning through educational technology would lead to improving at-risk student attitudes in the course. This restructure has two steps: 1) reordering the presentation of the course content to teach specific learning outcomes within the context of broad conceptual themes; 2) incorporating active and collaborative learning through technology into every lecture. The results indicated that teaching with implementing active learning through technology and collaborative learning in the first semester of the AY 2019-2020 dramatically improves student attitudes and performance.

There are several possible explanations for this result. First, the observed improvement of the students' attitudes toward the program could be attributed to the increase in their active motivation rather than the passive one toward learning language and content concurrently. To explicate, according to Pishghadam et al. (2019), a covert manifestation of the motivation construct is when individuals are just mentally engaged with a concept or task, and this engagement does not lead to any specific action. This is in contrast with active motivation, which is characterized by the full engagement and involvement (mentally and physically) of an individual in performing a task. Based on the results of this study, this happened in response to the active and collaborative activities performed through educational technology. Moreover, according to the findings of this study, we can infer that as well as the proposed restructured program, the students' positive attitudes contributed to their better performance. This is in line with Baporikar and Shah's (2012) proposition that students' attitudes and motivation do affect student skills and knowledge in GFP courses.

Second, the improvement of the students' performance may be explained by the fact that the incorporation of active learning into the program via educational technology maximized the opportunities for the students to negotiate the knowledge rather than simply exchange information. This helps students to acquire the language skills and the course content at higher levels of complexity (Grabe & Stoller, 1997). This proposition is further corroborated by Lee et al. (2013), who emphasized to promote students' performance in both content and language learning, we need to create for the students an environment that focuses on what they can 'do' with the language while engaging in discursive practices and scientific inquiry.

Another possible explanation for this can be clarified by the emotioncy model (Pishghadam, 2015), which accentuates the significant effect of individuals' involvement in a concept or task in their perceptions of the task-at-hand. More explicitly, emotioncy (the combination of emotion and frequency) holds the idea that individuals' sense-induced emotions towards a concept or activity and the frequency of their exposure to it can relativize their cognition (Pishghadam et al., 2013; Pishghadam et al., 2016; Pishghadam & Shayesteh, 2017) and assist them in the learning and retention of new materials (Jajarmi & Pishghadam, 2019). Based on this model, involvement refers to a level of understanding that is the result of using auditory, visual, and kinesthetic senses to get information about something as well as experiencing that thing and doing research on it. This is contrasted with the exvolvement level in which individuals just use their auditory, visual, and kinesthetic senses to gain the intended knowledge (Pishghadam & Shayesteh, 2016). In this study, the course was restructured so that students could move from the exvolvement level (lecture-based courses) to involvement (student-centered courses) through the use of active and collaborative learning via education technology. It seems that students were more involved in the process of learning, their active motivation increased, and their comprehension level was boosted. In fact, Emotionalization through technology can be a shortcut to higher levels of learning a subject matter.

Overall, the contribution of this study has been to confirm the effectiveness of CBI coupled with active learning strategies through educational technology. However, the findings of this study may be limited by the number of students that took part in the GFP during the AYs of 2018 to 2020. Therefore, further studies regarding the restructured program would be worthwhile. This study investigated the role of educational technology in Omani at-risk students' attitudes and performance in GFP; yet, there is abundant room for further progress in determining the influential factors in the success of CBI to promote both language and content learning. Moreover, this study was conducted in Oman, which limits generalization; other studies can be done in other countries and cultures to compare and contrast the results and extend generalization.

References

Armbruster, P., Patel, M., Johnson, E., & Weiss, M. (2009). Active learning and student-centered pedagogy improve student attitudes and performance in introductory biology. *CBE—Life Sciences Education*, *8*, 203-213. https://doi.org/10.1187/cbe.09

Auer, M. R. (2008). Sensory perception, rationalism, and outdoor environmental education. *International Research in Geographical and Environmental Education*, *17*(1), 6-12. https://doi.org/10.2167/irgee225.0

Baporikar, N., & Shah, I. A. (2012). Quality of higher education in 21st century: A case of Oman. *Journal of Educational and Instructional Studies in the World*, *2*(2), 9-18.

Baines, L. (2008). *A teacher's guide to multisensory learning: Improving literacy by engaging the senses.* ASCD.

Boyer, E. L. (1998). Reinventing undergraduate education: A blueprint for America's research universities. The Boyer Commission on Educating Undergraduates.

Bray, A., & Tangney, B. (2017). Technology usage in mathematics education research – A systematic review of recent trends. *Computers and Education*, *114*, 255-273. https://doi.org/10.1016/j.compedu.2017.07.004

Dill, D. (2007). Will market competition assure academic quality? An analysis of the UK and US experience. In D. F. Westerheijden, B. Stensaker, & M. J. Rosa (Eds.), *Quality assurance in higher education: Trends in regulation, translation and transformation* (pp. 47-72). Springer.

Driskell, S. O., Ronau, R. N., Rakes, C. R., Bush, S. B., Niess, M. L., & Pugalee, D. (2011, January). *Research in mathematics instructional technology: Current trends and future demands.* Paper presented at the 33rd Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Irvine, CA.

Echevarria, J., & Graves, A. (2003). *Sheltered content instruction: Teaching English-language learners with diverse abilities.* Allyn & Bacon.

Grabe, W., & Stoller, F. (1997). Content-based instruction: Research foundations, In M. Snow & D. Brinton (Eds.), *The content-based classroom: Perspectives on integrating language and content* (pp. 5-21). Longman.

Grabe, W., & Stoller, F. (2019). Reading to learn: How and why content-based instructional frameworks facilitate the process. In K. Koda & J. Yamashita (Eds.), *Reading to learn in a foreign language: An integrated approach to foreign language instruction and assessment* (pp. 9-29). Routledge.

Handelsman, J., Ebert-May, D., Beichner, R., Bruns, P., Chang, A., DeHaan, R., Gentile, J., Lauffer, S., Stewart, J., Tilghman, S. M., & Wood, B. W. (2004). Scientific Teaching. *Science, New Series*, *304*(5670), 521–522. https://doi.org/10.1038/003208b0

Jajarmi, H., & Pishghadam, R. (2019). Emotioncy-based language instruction: A key to enhancing EFL learners' vocabulary retention. *Applied Research on English Language, 8*(2), 207-226. https://doi.org/10.22108/are.2019.114399.1388

Jourdenais, R. M., & Shaw, P. A. (2005). Dimensions of content-based instruction in second language education. In R. M. Jourdenais & S. E. Springer (Eds.), *Content, task and projects in the language classroom* (pp. 1-12). Monterey Institute of International Studies.

Kennedy, T. (2006). Language learning and its impact on the brain: Connecting language learning with the mind through content-based instruction. *Foreign Language Annals, 39*(3), 471-486.

Lahann, P., & Lambdin, D. V. (2014). Collaborative learning in mathematics education. In S. Lerman (Ed.), *Encyclopedia of mathematics education* (pp. 75–76). Springer Reference. https://doi.org/10.1007/978-94-007-4978-8_23

Lee, O., Quinn, H., & Valdés, G. (2013). Science and language for English language learners in relation to next generation science standards and with implications for Common Core State Standards for English language arts and mathematics. *Educational Researcher*, *42*(4), 223-233. https://doi.org/10.3102/0013189x13480524

Lightbown, P., & Spada, N. (2006). *How languages are learned* (3rd ed.). Oxford University Press.

Montessori, M. (1912). *The Montessori method.* Cambridge University Press.

Orcos, L., Arias, R., Aris, N., & Magreñán, Á. A. (2016, June). *Collaborative learning: Implementation of JigSaw technique in Google.* Paper presented at the 2nd International Conference on Higher Education Advances. Valencia, Spain.

Pishghadam, R. (2015, October). *Emotioncy in language education: From exvolvement to involvement.* Paper presented at the 2nd Conference of Interdisciplinary Approaches to Language Teaching, Literature, and Translation Studies, Mashhad, Iran.

Pishghadam, R., Adamson, B., & Shayesteh, S. (2013). Emotion-based language instruction (EBLI) as a new perspective in bilingual education. *Multilingual Education, 3*(9), 1-16.

Pishghadam, R., Jajarmi, H., & Shayesteh, S. (2016). Conceptualizing sensory relativism in light of emotioncy: A movement beyond linguistic relativism. *International Journal of Society, Culture & Language*, *4*(2), 11-21.

Pishghadam, R., Makiabadi, H., Shayesteh, S., & Zeynali, S. (2019). Unveiling the passive aspect of motivation: Insights from English language teachers’ habitus. *International Journal of Society, Culture & Language*, *7*(2), 15-26.

Pishghadam, R., & Shayesteh, S. (2016). Emotioncy: A post-linguistic approach toward vocabulary learning and retention. *Sri Lanka Journal of Social Sciences, 39*(1), 27-36.

Pishghadam, R., & Shayesteh, S. (2017). Emo-sensory expression at the crossroads of emotion, sense, and language: A case of color-emotion associations. *International Journal of Society, Culture, and Language, 5*(2), 15-25.

Prince, M. (2004). Does active learning work ? A review of the research. *Journal of Engineering Education*, *93*, 223–231.

Richard, J. C., & Rogers, T. S. (2005). *Approaches and methods in language teaching*. Cambridge University Press.

Rogaten, J., Rienties, B., Sharpe, R., Cross, S., Whitelock, D., Lygo-Baker, S., & Littlejohn, A. (2019). Reviewing affective, behavioral, and cognitive learning gains in higher education. *Assessment & Evaluation in Higher Education*, *44*(3), 321–337. https://doi.org/10.1080/02602938.2018.1504277

Scager, K., Boonstra, J., Peeters, T., Vulperhorst, J., & Wiegant, F. (2016). Collaborative learning in higher education: Evoking positive interdependence. *CBE Life Sciences Education*, *15*(4), 1–9. https://doi.org/10.1187/cbe.16-07-0219

Seymour, E. (2002). Tracking the processes of change in US undergraduate education in science, mathematics, engineering, and technology. *Science Education*, *86*(1), 79–105. https://doi.org/10.1002/sce.1044

Siu, W. Y. (2021). Gaps in content-based English enhancement in science and engineering. In M. Bruce, J. Chen, L. Lin, & A. Urmston (Eds.), *English across the curriculum: Voices from around the world* (pp. 35-58). University Press of Colorado.

Sivaraman, I., Al Balushi, A., & Rao, D. H. (2014). Understanding Omani students' (university) English language problems. *International Journal of Sciences: Basic and Applied Research*, *13*(1), 28-35.

Snow, M. A., & Brinton, D. M. (1988). Content-based language instruction: Investigating the effectiveness of the adjunct model. *TESOL Quarterly*, *22*(4), 553-574.

Spenader, A. J., Wesely, P. M., & Glynn, C. (2018). When culture is content: Applications for content-based instruction in the world language classroom. *Language Teaching Research*, *24*(4), 475-495. https://doi.org/10.1177/1362168818799768

Stoller, F. L., & Grabe, W. (1997). The six t's approach to content-based instruction. In M. A. Snow & D. M. Brinton (Eds.), *The content-based classroom: Perspectives on integrating language and content* (pp. 78–94). Longman.

Thomas, H. (2003). The arguments for and the meaning of quality. *ELT Journal*, *57*(3), 234-241.

Tsai, Y. L., & Shang, H. F. (2010). The impact of content-based language instruction on EFL students' reading performance. *Asian Social Science*, *6*(3), 77-85. http://dx.doi.org/10.5539/ass.v6n3p77

Tuzlukova, V., Inguva, M., & Sancheti, P. (2019). Oman's general foundation programs: Focus on general education principles and standards. *Theory and Practice in Language Studies*, *9*(4), 480-486. http://dx.doi.org/10.17507/tpls.0904.17

Villalobos, B. O. (2014). Content-based instruction: A relevant approach of language teaching. *Innovaciones Educativas*, *15*(20), 71-83. https://doi.org/10.22458/ie.v15i20.515