

# A Computer-assisted Collaborative Reading Model to Improve Reading Fluency of EFL Learners in Continuous Learning Programs in Saudi Universities

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**Abstract**—Reading is not synonymous to comprehension; rather it is a prerequisite that doesn't, by itself, guarantee comprehension. This is to say that being efficient in decoding letters, syllables and whole words and recognizing vocabulary does not ensure natural r automatic comprehension. Fluency seems to be the bridge between the mastery of the mechanics of reading and the dynamics of comprehension. Abundant research exists that explores how to improve reading skills of EFL learners at Saudi universities. However little, if any, of this array of research sought to discern the potential effects of educational technology on the fluency of struggling readers in continuous learning programs. To fill this gap, this study seeks to probe the multi dimensions of the problem and suggest ways to solve it. For this purpose, 24 EFL lecturers from three Saudi universities were selected and interviewed. A suggested computer-assisted collaborative reading model was put forth to be applied in the three universities. Students were diagnosed by their instructors as gaining relatively enough grasp of decoding skills at the multi-levels of orthographic knowledge, mono and polysyllabic words, but exhibit slow and inaccurate reading indicating reprehensive symptoms for a fluency problem. The lecturers explained that the disappointment resulting from learners' inability to reach comprehension despite mastering decoding skills influences their attitudes towards reading and language learning, bringing about reading apathy and low self-esteem. The proposed model is designed to enhance reading fluency which is perceived as the underlying problem that makes the reader struggle. It is to be delivered partly individually and partly collaboratively online. Collaboration also is operated via face to face instruction especially in teaching the reading strategy. In doing so, the procedures followed are in line with the blended learning. The findings indicate clearly that the proposed model was successfully used to improve reading fluency through accelerating the different reading subskills for decoding and create positive attitudes toward reading. The results highlight the importance of establishing a level of automaticity that gives rise to the higher skills of comprehension.

**Keywords**—Collaborative reading model; computer-assisted language learning (CALL); computer-based instruction; EFL learners; fluency; Saudi Universities; struggling readers

## I. INTRODUCTION

English is gaining prominence in the Saudi community .This is reflected through the pivotal position the educational system assigns to teaching English. This is due to the role

English plays as a lingua franca and the different significant social, cultural and economic functions it fulfills along with being the international language of science and technology. The increasing demands for more proficient language learner locally and overseas impose pressure on educational stakeholders to secure such employable working force. Therefore, it is becoming integral part in all university programs [1, 2].

In response to such demands, a wide range of studies have been conducted to explore the possible factors, cognitive and affective, that contribute to the enhancement of the didactic practice and the development of the language skills in general and the reading skills in particular [3-6]. Nevertheless, the unique profile typical to continuous learning students compared to standard programs in terms of the program's admission prerequisites entails special attention to be directed to investigating the teaching and learning practices of such sector especially concerning struggling readers.

Reading, despite its undeniable significance for success in life and academia, is a problematic skill that a large number of continuous learning students stumble about. The cumulative struggling with reading is attributed to students' failing to master reading fluency. Therefore, a computer assisted collaborative reading model is suggested to enhance the different subskills making up fluency. The study attempts to answer the following questions:

- What are the missing reading skills that interfere with comprehension given the mastery of decoding skills?
- To what extent the computer assisted collaborative reading model is able to address the missing component?

A case study design was adopted to answer the aforementioned questions. Twenty four EFL lecturers and faculty members from three Saudi universities were selected and interviewed about the characteristic profile of the struggling students who flounder with reading in spite of the fact that they are good at decoding with its different subskills. A model was designed accordingly and the selected lecturers and faculty members were assigned to guide the collaborative part of the model and observe students' behavior and progress. The selected participants were then interviewed about the

usefulness of the proposed model in addressing the problems struggling learners face in these programs and mitigating the affective consequences arising as by-products of the problem.

The remainder of the article is organized as follows. Section 2 is a theoretical framework. It defines the key concepts of the study and sets the relation between computer-assisted collaborative models and reading fluency. Section 3 is a brief survey of the previous studies on the integration of CALL systems in EFL reading in the Saudi contexts. Section 4 is Methodology. It outlines data collection and analysis procedures. Section 5 reports on the results of the study. This is a qualitative data analysis of the data derived from the interviews with the selected EFL lecturers. Section 6 is Conclusion. It summarizes the main findings of the study and discusses the implications of the study to teaching English in continuous programs in the Saudi universities and to further research.

## II. THEORETICAL BACKGROUND

With the wide proliferation of technology and its powerful and reconfiguring penetration into most of our life domains including banking and shopping, the integration of digital technologies into teaching and learning language has become inevitable. This incorporation has resulted in changes within the structure of the teaching/learning environment away from the longstanding teacher dominated pedagogy towards a more student-centered leaning situation [7, 8].

The integration of technology into learning contexts has brought about new patterns concerning the role of both the teacher and the learner. This necessitates that both teachers and learners adapt to the new roles; the teacher has to be best prepared to step a little back and be sufficed with the facilitator role and the learners should develop a sense of responsibility to be up to the more autonomy granted to them [9]. Educational technologies afford learners broader opportunities through a flexible learning environment that respects their needs and ability levels and keeps up with their pace of learning. In this regard, e-learning systems extend the traditional learning space borders beyond the narrow sense of the regular classroom creating new and more promising scenery for teaching.

In a similar vein, Stanley and Thornbury [10] argue that technology is increasingly becoming integral part of learning delivery and that it opens the door wide to more innovative teaching practices. The introduction of technological advancements as instructional tools to teach language, which is termed as Technology Enhanced Language Learning (TELL), has contributed to addressing many of the problems learners used to encounter in their language classrooms. Under the broad term of (TELL), fall other disciplines including computer assisted language learning (CALL), mobile Assisted language learning (MALL) and Computer Mediated Communication (CMC). The research into how technology can be applied to language teaching has given rise to the emergence of some now widely touted fields like MALL and CALL [11, 12].

CALL is a learning approach that makes use of the computer software and the internet-based resources as a means

to deliver, reinforce and assess learning [13]. The advent of Web 2.0 tools with its characteristic features of interactivity and other aspects that facilitate collaborative learning provided the practical grounds for utilizing computers for teaching and learning purposes [14]. In its integration of education and technology, CALL comprises most ICT applications and learning approaches relevant to L2 acquisition [15].

With the unprecedented development of social media systems, networks, and platforms in recent years, social media as ICT tools have been extensively used instructionally [16, 17]. Research on social media used as pedagogical vehicles has yielded positive results. For example, Wang and Vasquez [18] reported that Facebook was effective in improving Chinese language learners' performance in writing. Similarly, Hamat and Hassan [19] surveyed Malaysian university undergraduates' perceptions about how helpful social networking services are in learning English and in what areas they have the most effect. Findings revealed that (99.7%) use the sites for learning English and the areas which benefited most were reading, writing, vocabulary acquisition and communication. In his investigation of the Bangladeshi university EFL learners' perceptions about how effective social media are in improving speaking skill, Mitu [20] reported an affirmative positive relationship. Digital games, another manifestation of CALL, have rendered promising results in terms of their ability to "motivate students, increase time on task and encourage collaboration and situated communication" [9].

There is a concern, among some scholars, that learning via computers can be a socially isolating experience due to the physical separation between students. This is to mean that collaboration should be an integral part of CALL to mitigate this concern. Most importantly, teamwork seems to be an inherent human desire and perhaps a necessity. This applies to learners who mostly like to work and learn together [21]. Collaborative learning is essentially and organically related to e-learning where students work together to achieve a common task via different ICT tools and devices including live chat or instant messages in order to expand their knowledge and make use of one another's strengths [22]. In fact, collaboration is significantly useful in language acquisition as it serves as a scaffolding vehicle through which learners mutually help each other enhance their language ability and facilitate meaning communication. It also enhances social interaction and hones thinking skills. Moreover, it familiarizes learners with the model practice expected both in the academia and beyond [21].

CALL, MALL and TELL are essentially about the integration of technology in second or foreign language acquisition. Kasemsap [23] argues that these three environments share the powerful potentials of improving the motivation and attitudes of language learners toward language learning. It can be argued that the use of CALL and MALL is essentially the same given that applications accessed by mobile can also be accessed by the computer. According to Egbert [24], CALL does not necessarily involve computers as he argues that CALL means learners' learning language in any context with, through, and around computer technologies. It is

also possible to take the computer technologies a step further to include digital technologies. This might be the reason why Ogata, et al. [25] consider MALL as falling under CALL as they use the term “computer assisted mobile learning.

Since most practical utilizations of both CALL and MALL are essentially based on the interactive feature associated with the emergence of Web 2.0 tools, it seems valid to claim that both the two systems differ only in the degree of mobility not in purpose of use or the underlying rationale. Yaman and Ekmeççi [26] consider the shift as just a transfer of functions from the computer to the small mobile device. Kukulka-Hulme and Shield [27] contend that the size and mobility aspects are the distinctive features of MALL that afford learners new ways of learning, emphasizing continuity or spontaneity of access across different contexts of use”. They think that the two terms are complementary and each system has its relevant conditions that make its use more advisable than the other. Thus, occasions determines which system is used.

Fluency is simply defined as reading accurately and quickly in a conversational like manner. Thus, for fluency to embryonate and materialize, these three elements should occur together [28-30]. Fluency is a complex multilayered construct that deals with many levels of processing including “decoding fluency, processing speed, vocabulary, letter sound fluency, and sight word fluency” [28]. The complicated and stratified nature of fluency is clearly reflected in the definition given by Fuchs, et al. [31] which states that fluency is made up of a group of sub-processes including a reader’s perceptual skill at automatically translating letters into coherent sound representations, unitizing those sound components into recognizable wholes, and automatically accessing lexical representations, processing meaningful connections within and between sentences, relating text meaning to prior information, and making inferences to supply missing information [31].

This is to imply that reading fluency deals with the lower and the higher order reading processes constituting a link between them through a dynamic reciprocal backward and forward relationship [28]. Decoding and comprehension remain latent until fluency connects the two extremes of the circuit. Samuels [32] puts this in other words as he considers fluency as “decoding and comprehending at the same time”. For him accuracy, speed and prosody are operational of the construct. Hence, fluency can be conceptualized as the automatic utilization of all reading processes and sub-processes, a conceptualization advocated by Wolf and Katzir-Cohen who argue that “fluency is influenced by the development of rapid rates of processing in all the components of reading [33].

It is the conscious deliberate analysis of each or any of the different decoding levels that slow down processing and might get the reader to be stuck at one or more of the levels. This means that automaticity must be at every level and there must be gracious and smooth transfer between levels [28]. The automaticity as the cornerstone of fluency is underpinned on the theory of automatic information processing in reading suggested by LaBerge and Samuels [34]. It posits that the processes and sub-processes of reading decoding should be

executed automatically with minimal cognitive effort so that the saved mental capacity is directed to the more important goal of reading, which is making sense of the read material. According to the theory, poor reading is likely to occur when the readers use up most of their cognitive capacity in the lower surface-level processes of reading leaving little mental resources for comprehension. Reaching automaticity goes through some steps; a teacher is needed to instruct learners in developing the skills at the conscious level, as a first step. Then comes the role of the repeated practice that takes the performance to the sphere of automatic practice [35].

### III. LITERATURE REVIEW

The Saudi research community in the applied linguistics arena is quite active as for exploring the multifaceted aspects of language teaching and learning. This is also true to the research efforts that addressed the digital learning applications to the development of the reading comprehension skill. This body of research, with its breadth and width, has especially highlighted the unique usefulness of CALL systems in leveraging reading comprehension among the EFL university learners in Saudi Arabia [36-40].

Learning approached via technological devices is privileged by many advantageous aspects which traditional learning falls short of reaching. Bensalem [41] argues that manipulating the CALL rationale to teach reading pays off positive results since these systems facilitate the interaction with the texts, provide for the different learning styles and meet the differentiation considerations necessary to reach all learners. The inherent engagement friendly nature of such systems and the provision for individualized learning and tailoring it to suit the needs and ability level of the learners qualify it as an effective tool for addressing the non-intelligence affective factors such as shyness and poor attitudes. This promising influence of CALL is extended to all levels of sub-skills constituting the overall reading skill. Hassan Taj, et al. [42], for example, reported that CALL is instrumental in improving many of the reading related skills including decoding, word recognition and retention in addition to enhancing the working memory.

Abanomey [43] investigated the influence of the internet reading on the overall reading performance of the undergraduate students of Riyadh College of Technology. Results showed that internet-based reading has more positive effect on reading than the print-based reading. He attributed the results to the motivation inspired by using the internet and to reported that the internet reading enables students to select the proper skill and strategies as needed.

Likewise, wide range of research has covered the scope of the mobile technology in education. Alshammari, et al. [44] surveyed the university tertiary students’ attitudes towards the uses of WhatsApp to conclude that students hold positive attitudes towards such mobile text messaging applications. Moreover, Khojah and Thomas [39] explored the potential effect of the MALL activities on the students in reading classes. Results disclosed significant increase in students’ reading achievement, attention, participation, and volunteering. High motivation and positive reading attitudes were also reported. Keezhatta and Omar [1] explored the

potential relation between MALL and reading comprehension and finding indicated a significant effect of MALL on reading due to the motivating learning environment the system creates. Albiladi and Alshareef [45] surveyed the Saudi English teachers' perceptions about tablets' incorporation in language teaching. It turned out from results that teachers think tablets have facilitating instructional benefits.

Research has also pointed out that CALL has positive effect on the affective side of the learners including motivation, attitude and self-esteem. In their study done on Saudi EFL secondary students, Keezhatta and Omar [1] found that digital technologies positively impacted students' motivation and attitudes toward language learning. They explained that the effect is due to the motivation triggering nature inherent in the instructional computer setting and the reciprocal relation between reading and motivation. The digital technologies context afforded students with some important affective weapons; it equipped them with a sense of security that helped them to build confidence in their ability; a sense of control and as thus responsibility for their learning. Likewise, Alotaibi [46] in his study conducted on university undergraduates reiterated similar results concerning the positive effect of CALL on learners' motivation. Alotaibi [46] documented a strong relation between mobile-assisted language learning (MALL) and enhancing reading motivation.

Beyond the Saudi EFL setting but still within the broader EFL context, technology-mediated instruction proved effective in teaching reading. Varol and Erçetin [47] compared the use and non-use of glosses and hyperlinks at the lexical and topic levels and found out that this technological intervention helps significantly with word recognition, but that effect was not observed for reading comprehension. Alharbi [36] conducted a study on Saudi undergraduate EFL students in Qassim University and came to similar results concerning relation between reading and glossing. Similarly, Ali [48] compared a computer based instruction with the teacher based instruction as for their effect on three reading specific skills, namely speed, vocabulary acquisition and comprehension. Participants were undergraduate students from two universities based in Oman and UAE. Results were in favor of the computer assisted reading. Three considerations were suggested to account for the findings: the engaging activities that capture learner's attention and motivate them to read; the immediate feedback and the sense of autonomy and control learners felt.

Mahmoudi, et al. [49] investigated the attitudes of Iranian postgraduate students in a university in Malaysia toward computer assisted English language learning (CAELL) and their performance concerning the English language vocabulary. Results revealed that learners have positive attitudes to CAELL and a mutually positive correlation was established between the attitude and performance in vocabulary. Digital games, another manifestation of CALL, has rendered promising results/in terms of their ability to motivate students, increase time on task and encourage collaboration and situated communication [9].

Enriching the electronic environment with the social aspects of learning is also highlighted by research in the EFL

context. Lan, et al. [50] used MALL environment as a mode for a peer-based collaborative learning to examine the effect of this mobile-device-supported peer-assisted learning (MPAL) on primary school's reading performance. The intervention was found out to have improved both collaboration level and the reading motivation. In the same fashion, Chen, et al. [51] used the web annotation system as a web-based collaborative reading annotation system (WCRAS) together with gamification mechanisms to promote the reading performance of Taiwan elementary schools and positive results were reported. Yang, et al. [52] investigated the effect of the synchronous form of collaborative learning employing Group scribble on the reading comprehension of Chinese primary schools. Results showed better reading comprehension and enhanced motivation to learn collaboratively through Group scribble. Ae-Hwa, et al. [53] examined the effect of Computer-Assisted Collaborative Strategic Reading (CACSR) program on disabled students' reading comprehension performance. Findings revealed that the program has significant effect on reading.

To summarize, digital technologies with their different demonstrations, including CALL, constitute a pivotal pedagogical vehicle in foreign language teaching and learning. Such educational technologies are especially useful in teaching reading comprehension due to their flexible nature and their potentials in providing individualized reading instruction that meets the varied needs of the learners and keep up with their pacing. In the Saudi context, prolific research has been done on the different aspect of reading comprehension. However, little is devoted to address the struggling readers' profile of the continuous learning programs in Saudi universities, even less is directed to the reading fluency. Hence, this study attempts to fill this gap through targeting this population with a computer-assisted collaborative reading model intended to improve their overall reading performance with special emphasis on reading fluency as a mediating reading process necessary to achieve comprehension.

#### IV. METHODS AND PROCEDURES

Both male and female lecturers were selected. There were 13 female lecturers and 11 male lecturers. It should be noted that sex segregation is still imposed in the Saudi universities, even with the drastic social and political developments and changes the country is witnessing today. In this regard, female lecturers are more likely to teach in female sections only. Although it is not a rule, female lecturers are not normally selected for teaching male students even in distance and online programs.

This study is based on a case-study design. It is limited to the continuous education programs in the Saudi universities. In so doing, the tool of unstructured interviews was adopted. Interviews took place between September-December, 2020 in three Saudi universities: King Abdulaziz University, King Saud University, and Prince Sattam Bin Abdulaziz University. Twenty four EFL lecturers in three Saudi universities were selected. Only EFL lecturers with first-hand experience in teaching in continuous learning programs in the Saudi universities were included in the study. Representativeness

was also considered for reliability and generalizability purposes. The participants come from different backgrounds.

The participants represent different age groups. They also occupy different positions (language instructors, lecturers, and faculty members). They also come from different countries including Egypt, Jordan, Morocco, Saudi Arabia, and Tunisia.

For data analysis purposes, thematic content analysis was adopted. The rationale is that thematic content analysis can be usefully used to address many of the limitations including selectivity and subjectivity that are always associated with qualitative data analysis approaches [54-58].

The interviews were conducted at two subsequent rounds. First, the participants were asked about the challenges and needs of the EFL learners in the continuous learning programs. Based on these discussions, a collaborative reading model through in-session courses was developed. Second, they were asked about the effectiveness and usefulness of the proposed model.

Thematic content analysis is now supported with different computational systems whose function is to derive the important and relevant information within the qualitative data sets [59]. These computational systems are designed to help researchers with preparing, coding, and analyzing data [60]. For the purposes of the study, ATLAS.ti was used. This is a qualitative data analysis software developed by Scientific Software Development Company in 1993 to address the needs of academic and industry researchers who are involved in qualitative data analysis [61].

ATLAS.ti was selected for convenience reasons. It supports qualitative analysis of large bodies of textual, graphical, audio and video data. It can be usefully used to arrange, reassemble, and manage materials in systematic ways. Furthermore, it has been proved effective in education, teaching, and applied linguistic studies [62-64]. The use of ATLAS.ti includes six main steps or stages. These are pre-processing of data, input data into the computer using ATLAS.ti, exploration of the material, coding, categorization, and treatment of the results [65]. These are shown in Fig. 1.

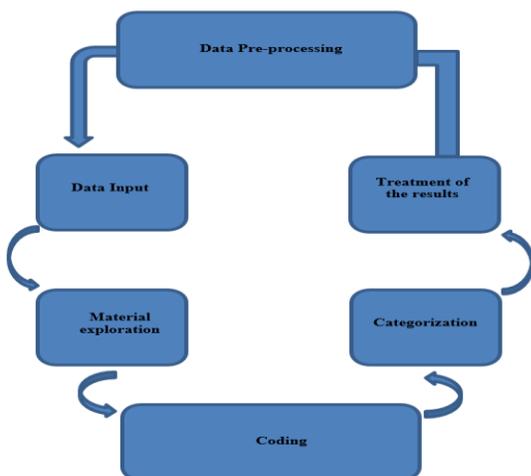


Fig. 1. Steps of Performing Thematic Content Analysis using ATLAS.ti.

All the data were pre-processed, entered into the software, explored, and coded. They were then categorized and classified into the common and key themes mentioned by the participants. One advantage with the software processing is that it reduces selectivity and subjectivity which are common problems with qualitative data analysis. Based on data processing procedures, the participants focused on some common themes including the unique nature of EFL learners in the continuous learning programs, reading challenges, and the special needs of the EFL learners in the continuous learning programs, and learners' performance before and after receiving the in-session course. These are discussed in detail in the next section.

## V. ANALYSIS AND DISCUSSIONS

The participants almost agreed that the EFL learners in the continuous learning programs in the Saudi universities face unique linguistic challenges due to different reasons including the Saudi educational system itself which used to focus on Muslim teachings where English was used by some as a threat to the Arab and Muslim identity [66]. These perceptions had negative implications to teaching English as a second language in Saudi Arabia for decades. For many years, English was not taught at primary schools lest students are badly influenced by the English structures [1]. To a large extent, English language teaching was very limited in the Saudi schools and universities [67].

The findings also reflect clearly that reading is the most challenging language skill to the EFL learners in the continuous learning programs. This is clearly reflected in the students' scores. According to the participants, students usually score the less in reading courses and activities. They attributed the failure of the students to some reasons including the differences between Arabic and English, lack of prerequisite linguistic knowledge, study materials, and enrollment conditions. The interviewees pointed out that though students received instruction in decoding at the different levels, they often get stuck at the decoding level failing to make sense of what they read. Such recurrent failure get them disappointed demotivated to read more due to their low self-esteem and thus perpetuating the problem.

Given the different nature of the continuous learning programs, the participants almost agree that the linguistic challenges and needs of the EFL learners in these programs are in many ways different from those of their counterparts in standard programs. Struggling readers in the continuous learning programs need a learning environment that considers their social and professional backgrounds. Many of these learners are full-time employees and the vast majority of them have not been exposed to reading English texts for years.

In light of these findings, it can be claimed that such weakness profile is indicative of a reading fluency problem and accordingly a computer assisted collaborative reading model was suggested to enhance automaticity of the different reading sub-skills with the purpose that such intervention could bring about the desired comprehension and address the problematic affective byproducts of demotivation, negative attitudes and low self-esteem. The rationale is that the integration of CALL systems have been usefully used over the

recent decades in improving different reading skills of EFL learners including word recognition and decoding skills within a short period of time. Furthermore, CALL systems and activities are usually associated with creating motivating learning environments. According to Hubbard [68], CALL systems have the potentials of developing L2 reading skills in a limited span of time compared to traditional teacher-led models. They are also found to be a source of great excitement and enjoyable. Furthermore, numerous studies reported the effectiveness of CALL systems in relation to adult learners with little linguistic background [69, 70].

The proposed computer assisted collaborative reading model was voluntarily conducted by the participant EFL lecturers and faculty members through in-session courses to help struggling readers with the reading courses and improve their reading performance through focus on practice of the different reading skills so as to reach the level of automaticity and the employment of reading strategies in a collaborative mode.

The interviewees finally stressed that the learners responded positively to the proposed model which had a significant impact on the learners' performance and overall achievement. They outlined that the proposed model provided the learners with a self-paced learning environment in which they will work with high level of interest at a faster pace. They added that the model improved the learners' skills in pronunciation, vocabulary, use of words in different contexts, and comprehension. They also reported that learners' skills in relation to vocabulary recognition and text understanding were considerably improved.

Results indicate that the model proved effective in improving students' reading fluency and reading comprehension performance. In addition, the affective profile of the students improved as a result. This can be attributed to some factors; dealing comprehensively with the reading process from its two extremes, decoding and comprehension, through accelerating decoding pace to the level of automaticity and the application of strategic reading to the level of comprehension; the collaborative mode of the computer assisted language learning was useful in many ways including securing the social interaction and scaffolding students into more reflection on their mental processing through comparing their performance with their peers.

It can be finally suggested that there is a necessity for adding the social aspects of learning to the computer-based learning and to get both teachers and students prepared for such shift from class based to virtual space-based learning. In addition, the face-to-face interaction between students and their teacher is necessary which underscores the significance of the blended learning and stress the fact that technology will not replace teachers; teachers who use technology will replace those who don't.

## VI. CONCLUSION

The study attempted to discern why decoding supplementary intervention do not make a good reader; they produce symbol decoder at some degree; yet they fail to qualify students into comprehenders. Interviews were done

with instructors selected from three universities to draw out the essential information underlying such reading deficiency. Interviewees pointed out that though students received instruction in decoding at the different levels, they often get stuck at the decoding level failing to make sense of what they read. Such recurrent failure gets them disappointed and demotivated to read more due to their low self-esteem and as thus perpetuating the problem. Based on the interview results, researchers supposed that such weakness profile is indicative of a reading fluency problem and accordingly a computer assisted collaborative reading model is suggested to enhance automaticity of the different reading sub-skills with the aim that such intervention could bring about the desired comprehension and address the problematic affective byproducts of demotivation, negative attitudes and low self-esteem. It was obvious that the proposed model was effective in improving students' reading fluency and comprehension. The students' affective profiles changed as a result. Though the study is limited to addressing the reading challenges and needs of EFL learners in the continuous learning programs in the Saudi universities, the findings of the study can be applicable to other populations.

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