Impact of Collaborative Reading Annotation System on EFL/ESL Learners on A Digital Platform: A Case Study of Tertiary Level Students in Bangladesh

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Abstract

The year 2020 is a significant milestone in the history of human civilization. Due to the outbreak of the Covid-19 pandemic, the whole world literally came to stand still. The loss of human lives, the financial setback, new-norms of social behavior, potential threat to the progress of education and the mass paranoia have forced the world order to re-consider the traditional lifestyle and values. As a part of this re-consideration, Bangladesh with the aid of Bangladesh Research and Education Network (BDREN) came forward to offer the Zoom platform to all the educational institutions in the country for free in order to continue the progress of education. As a result the screen time of all the students increased. They started to spend considerable time reading electronic materials and media. Nevertheless, many studies show that screen-based reading tends to lead students to surface reading, attention deficiency and that results in poor comprehension. This study, thus, explores the use of a collaborative reading annotation system (CRAS) that enhances digital reading performance on an online platform. A group of thirty low-achievers in a Short Stories course was selected and CRAS was introduced to them. At the end of four months' intensive instruction, a significant change in their performance was noted. Moreover, the group showed a remarkable interest in the reading tasks and high learning satisfaction.

1. Introduction

Amazon, KITABOO, Barnes and Noble Press and other online book sellers are now in a prominent position in selling e-books than ever. Electronic resources at different libraries are also becoming popular day by day (Liu, 2012). Eden and Eshet-Alkalai (2013) showed in their study that readers in both medium (print and digital) performed well; in fact the digital readers were found to perform faster with no lower accuracy than the print readers. This in effect changes the discussion trend in the higher education regarding the use of digital text for learning and teaching in academia. Moreover, the year 2020 is a significant milestone in the history of human civilization. Due to the outbreak of the Covid-19 pandemic, the whole world literally came to stand still. The loss of human lives, the financial setback, new-norms of social behavior, potential threat to the progress of education and the mass paranoia have forced the world order to re-consider the traditional lifestyle and values. Especially the developing countries like Bangladesh needed to seriously consider their ways out of the standstill mode due to the pandemic. Though lagged behind in the use of technology in the education sector, the government of Bangladesh (GoB) promptly decided to continue the education in all four sectors (primary, secondary, higher secondary and tertiary) through online platform. Bangladesh Research and Education Network (BDREN) came forward to offer the Zoom platform to all the educational institutions for free in order to continue the progress of education. As a result, the screen time of all the students increased. They started to spend considerable time reading electronic materials and media.

Digital reading offers quite a number of added advantage over the print version like the interactivity of the text, nonlinearity, easy to access information, and the inclusion of text-image-audio-video facility (Chen & Chen, 2014). However, Carr (2010) argued that screen time and the fragmentary nature of hypertext pose a threat to any substantial reading resulting in 'shallow reading'. The in-depth reading and concentrated reading that is claimed to be found in print reading are found to be missing in the case of digital reading to many extent (Chen & Chen, 2014). The process of reading in digital platform is different from cognitive point of view from reading a content in print medium that requires a different set of brain function, the context, cognitive focus, comprehensibility and reading speed (Coiro & Dobler, 2007; Cull, 2011). Incorporating hypertext and hypermedia in comprehending a reading passage require a complete different set of skills and abilities than those required for conventional linear print (RAND Reading Study Group, 2002). Of course it is undeniable that good reading comprehension ability has much to do with the capacity to read deeply and to sustain concentration for a certain period of time. Fuchs et al. (2001) found out that learners with poor reading skills tend to have lower self-esteem, more discipline problems, and a lower rate of graduation. Undoubtedly, the difficulty of setting a reading

comprehension passage involves complex and complicated factors like linguistic, cognitive and socio-cultural barrier for the learners of English as a Foreign Language (EFL) (Zoghi et al., 2010). Study on L1 reading process has now condoned the fact that L2 reading can be improved substantially only by concentrating on developing strategic readers who can manage independent learning contexts (Baker, 2002; Grabe, 2004; Zoghi et al., 2010). This is where the strategic reading development (Grabe, 2004) comes into play. Strategic reading refers to "the application of reading strategies as heuristics and aids that can facilitate reading comprehension and overcome comprehension breakdowns at both the word and sentence levels" (Aarnoutse & Schellings, 2003 cited from Zoghi et al., 2010). Usually, strategic reading is combined with a collaborative learning strategy where peers work in pairs/groups independently or in a guided environment. This may include a project where the students help each other understand the task and in completion of the task (Akhand, 2015). This helps them in interacting among themselves and in increasing the understanding of a text. Collaborative annotations of a digital text can facilitate this process and opens a vista of opportunity of sharing knowledge among the readers.

Annotation typically means a note of explanation or comment added to a text in order to enhance the understanding of the text. In fact, annotated content enable a reader to achieve a deeper and broader understanding in comparison to the non-annotated digital content (Porter-O'Donnell, 2004). Many researches (Ovsiannikov, Arbib, & McNeill, 1995; Rau, Chen, & Chin, 2004; Nokelainen et al., 2005; Zoghi et al., 2010; Chen & Chen, 2014) highlighted the fact that collaborative annotation tools can have positive impact on the reading performance and can benefit the collaborative reading. To trace the impact of the collaborative annotation application in digital reading environment, this paper studies the role of CRAS both as a scaffolding tool and as a learning method combined with sessions of interactive discussion on a group of low-achiever students. The purpose of the study is to determine whether the experiential CRAS in the collaborative reading setting supports and aids in improving the group's performance.

2. Literature Review

Reading is an essential skill and is complex process that involves of several complex operations. Whether the reading text is in L1 or in L2, this skill requires a set of capability, cognitive capacity, the learners' knowledge on the language, reading strategies and the role of L1 on L2 (if the text is on L2). Reading has been defined in various ways. Koda (2007) defines that reading is "converting print into language and then to the message intended by the author". She also asserts that "Comprehension occurs when the reader extracts and integrates various information from the text and combines it with what is already known (Koda, 2004). Hellekjaer (2007) says, "reading comprises of decoding the written text on the one hand and efficiently processing the information on the other hand". Grabe (2009) puts forward a list of processes that define reading:

1. A rapid process
2. An efficient process
3. A comprehending process
4. An interactive process
5. A strategic process
6. A flexible process
7. A purposeful process
8. An evaluative process
9. A learning process
10. A linguistic process

Reading skills and reading strategies are oftentimes used synonymously in literature on reading. Roe (2009) (cited from Bakke, 2010) claims that reading strategies are those that are used by readers in order to increase their understanding. Hudson (2007), however, gives the definition of Paris, Wasik, and Turner (1996) –

"Skills refer to information-processing techniques that are automatic, whether at the level of recognizing phoneme-grapheme correspondence or summarizing a story. Skills are applied to text unconsciously for many reasons, including expertise, repeated practice, compliance with directions, luck, and naive use. In contrast, strategies are actions selected deliberately to achieve particular goals. An emerging skill can become a strategy when it is used intentionally. Likewise, a strategy can 'go underground' … and become a skill. Indeed, strategies are more efficient and developmentally advanced when they become generated and applied automatically as skills".

This matches with what Grabe (2009) says – "strategies are cognitive processes that are open to conscious reflection but that may be on their way to becoming skills". Hudson (2007), Grabe (2009) and Roe (2009) put forward a compilation of a list of reading strategies that are common among the readers:

a) Activation prior knowledge
b) Answering questions and Elaborative Interrogations
c) Constructing mental images
d) Forming questions

e)   Making associations
f)   Monitoring
g)   Previewing
h)   Summarization
i)   Text-structure awareness and story grammars
j)   Using graphic organizers
k)   Rereading
l)   Adjusting speed
m) Concentrating
n)   Selectively reading

All these are important tools that a learner may implement in order to be a better reader. In the case of our department (Department of English) mostly extensive reading is required. It is reading to extract general meaning of a text. Siemensen (2007) defines that extensive reading "usually means silent reading and reading for pleasure and enjoyment. A global understanding of the text, i.e. without grasping every part of it, is normally aimed at in extensive reading". Another important aspect of this reading is that a large portion of texts are usually covered under the extensive reading (Bamford & Day, 2002). Hudson (2007) categorizes reading skills into four:

I.   **Word-attack skill** is the ability to transfer the orthographic symbols into meaningful language and to do this one requires to recognize the syllables, word boundaries, upper and lower case letters etc. in the text (Hudson, 2007).

II.   **Comprehension skill** is to do with the use of reader's background knowledge and context to understand the text which involves the grammatical competence, knowledge of the target language, application of metacognitive knowledge etc. (Hudson, 2007).

III.   **Fluency skill** is the ability to read without any 'interruption' that often may occur due to language barrier, difficult word or cultural shock. This interruptions lead to fragmented reading and tend to slow down the reading process (Hudson, 2007).

IV.   **Critical reading skill** is the ability to "analyse, synthesize and evaluate what is read" (Hudson, 2007) and requires the capacity to identify the cause-effect relationship in a text, recognize the arguments etc.

There are four models associated with L1 reading skill – top-down, bottom-up, interactive and new literacy approach (Grabe, 2009; Hudson, 2007). The new literacy approach recognizes the active role of the social and anthropological aspects on reading (Hudson, 2007). Bernhardt (2005) developed a model illustrating the interaction between L1 and L2 in learning a new language. Her three-dimensional compensatory model (Appendix 1) acknowledges that knowledge is not additive, rather "operates synchronically, interactively and synergistically" (Bernhardt, 2005). This model illustrates that the learners can use their L1 knowledge to make up for the deficiencies in L2 knowledge. Variances, however, are there that are unaccounted for in case of comprehension and reading performance in L2. Bernhardt (2005) concluded by admitting that there are still challenges and problems in L2 reading which need to be addressed in order to further progress in teaching reading in second language.

This study is influenced by the theoretical approach known as social constructivism. Vygotsky (1962) propounded this theory and asserted that knowledge is not a singular construct but rather exists in different form and interactive dimensions. In fact, this theoretical approach assumes that learners are involved in active process of meaning making through social interactions (Fosnot & Perry, 2005; Felix, 2005). Under this approach, the pedagogical model acknowledges the interaction is necessary in the learning process. According to Lantolf (2000), language is a psychological tool that can be "characterized by being produced through social activity, rather than arising organically". So, an environment that cater to enhance interaction and to promote the use of language for social construction of meaning will improve the four skills of language, especially the reading skill. In the light of the social constructivism, reading is viewed as collaborative experience where a reader is a member of a socio-cultural group. This view on reading highlights the fact that comprehension of a reading text is socially constructed and occurs from social interactions. Kiili et al. (2012) claimed that collaborative reading is socially contextualized and needs at least one other person and their study took the collaborative reading as a potential for co-construction of meaning and knowledge. Huang (2012) stated that collaborative reading makes students aware that reading is a group activity and by working and communicating in a group, readers are able to develop new ideas, improve reading experience, and reduce their tension and performance anxiety. Sharing of resources that in turn impacts on the reading outcome is also a vital point for collaborative reading. Fuchs et al.'s (2001) study showed that commonly practiced collaborative learning methods in a conventional reading instruction situation are 'Cooperative Integrated Reading and Composition' and 'Reciprocal Teaching'. But traditional collaborative reading instruction is bound by time and space. Moreover, they have little or no scope for interaction, communication, coordination, negotiation, sharing, and discussion within a learning group (Chen & Chen, 2014). These shortcomings are, however, overcome in a computer mediated collaborative learning

system. Reading annotations generally address four skills of a learner: attention, organization, indexing and discussion (Yang et al., 2011). In order to improve learning performance of a learner, Yelland and Masters (2007) stressed upon three scaffolds: cognitive, technical and affective. The cognitive scaffold is related to the development of conceptual and procedural understandings; the technical scaffold addresses the use of computer; and the affective scaffold aids learners concentrate on a task and stimulate them in applying higher order thinking. The use of scaffold significantly contributed in helping students better understand a text (Chen et al., 2011). Various studies showed that students tend to join actively in collaborative learning and that brings about a substantial change in their learning behaviours that include self-reflecting, elaborating, internalizing, and showing support to other students (C-M Chen et al., 2020).

Discussion-based teaching method is also a key to successfully implement collaborative reading. This caters to the development of reading performance by attaining a significant level of interpretation of a text and also facilitates higher-order questioning and explanation and argumentation (Kiili et al., 2012). Discussion can be traditional through in-person conversation or computer mediated through digital discussion board, online forum, chat rooms etc. (Chen & Chiu, 2008). Though the importance and relevance of classroom discussion is imperative, many studies have found that students hardly asks questions or responds to any questions in the classroom (Caspi, Chajut, Saporta & Beyth-Maro, 2006; Crombie, Pyke, Silverthorn, Jones & Piccinin, 2003). On the other hand, computer-mediated discussion encourages the use of formal, research-oriented evidence and critical thinking ability as it is asynchronous which allows some time for reflecting and researching before responding (Guiller, Durndell & Ross, 2008). Taking into consideration of all the positive aspects of collaborative reading, reading scaffold and interactive discussion, this study explores the impact of the CRAS to develop the digital reading and attitude and experience of students.

4. Research Questions
Based on the objective of the study, the following research questions have been formulated:
   a) Does the introduction of CRAS in the reading instruction aid the low achiever students in developing their reading experience and performance?
   b) How do the ESL/EFL students respond to the CRAS approach of learning/teaching reading in the class?
   c) Can CRAS be feasible at the tertiary level in Bangladeshi context?

5. Methodology
The research is a blend of qualitative and quantitative research. It focuses on a group of thirty students all of whom are in the final year of B. A. Honors in English program of Eastern University, Bangladesh. Their average age is 21-22. They have all had low grades in the course **Eng 455 Short Stories (British, European, American and Commonwealth)**. All the participants willingly took part in the pilot project and knew the result would be published. But the identity of the participants will be kept anonymous in the final research paper. The university authority has approved the project and does not require any further approval from any committee. The CRAS has been piloted in this course in order to examine how the students react to this new mode of instruction and learning and if there is any improvement in their grades. It is a course where they study short stories by Leo Tolstoy, Graham Greene, E M Forster, Anton Chekhov, James Joyce, Earnest Hemmingway, George Orwell, Chinua Achebe, Catherine Mansfield, O'Henry to name a few. The texts have been provided through Google drive and they have the access to read and annotate along. The annotations provided by the instructor work both as scaffold and as clarification of the text. Google drive has been chosen because of its easy accessibility and user friendliness. All the students have Google account and so it has become easy to bring along all the students on a common platform. The annotation process was also quite simple and required less effort on the part of the instructor. Once the CRAS was introduced to the class, the participation of the students was smooth and they did not face any problem in carrying out the tasks.

6. Procedure
The purpose of the research is to observe how the students perform while they use CRAS in their in-class and out of class learning. The study also records their scores and the way they negotiate with the new learning system. As they have already taken the course before and have done poor, there is also an issue of motivating them through the use of CRAS. A very common platform, Google Drive, has been used for CRAS keeping in mind the challenges that the students face in Bangladesh while accessing the internet. So, an easy-to-use platform like Google is a perfect choice for the class. The total assessment weightage is divided under two categories: formative (class attendance and performance, quizzes, class tests, assignment, presentation) carrying 50% of the total weightage and summative (midterm and final) carrying the other 50% (detail in Appendix). All the assessments occurred in the physical classroom except the class performance that was weighted on the basis of their interactions and discussions in the form of annotations.

7. Result and Discussion

The qualitative data indicates that 93.33% of the students positively took the inclusion of CRAS in their classroom teaching/learning process. A questionnaire was distributed among the students after the completion of the course (but before they sat for the final exam). Majority of the respondents agreed that the inclusion of the collaborative reading annotation system played an important role in their study and helped them to overcome the inhibition and disinterest in the second language reading. The focus group discussion put forward interesting information from the students regarding their reading experience in the previous courses and in the current one. One of them said,

"The new system, in fact, has made reading the stories an interesting experience. I had no idea that reading can be this much appalling. I have never felt I am alone struggling with my study. This helped me a lot."

Another student, who confessed that she had a phobia while attempting reading comprehension questions in the past, said,

"The group study (she actually meant the collaborative nature of the CRAS) made me more confident and the constant help from my classmates and teacher was good for me."

However, there were students who did not feel comfortable with the new system. One of them opined,

"I do not know how this could help me. Rather, I do not feel ok with reading and writing (he meant annotation) at the same time and all the other looking into it."

The other student mainly indicated the difficulty of accessing the internet apart from facing performance anxiety.

The change in the nature of the classroom instruction and in the learning strategy broke the inhibition among most of the students. They could instantly 'annotate' their difficulty and interact with their friends and with the teacher at the same time. The scaffolding questions, notes and hints from the teacher aided them in going through the texts without getting stuck up at one point. Most of the students appreciated the group or cooperative learning procedure that CRAS promoted in the in and out of class study. The collaborative 'inputs' that came in the form of annotations and virtual interactions among the readers actively helped them in 'answering questions and elaborative interrogations', 'constructing mental images', 'making associations', 'summarizing' and in 'concentrating' (Grabe, 2009 and Roe, 2009). So, the finding suggests that the CRAS helped the low achievers in improving their reading experience in the classroom. The annotations provided by the instructor scaffolded the students in their reading and encouraged them in engaging in active participation in understanding a text.

The results (Appendix 3) of the students showcase the improvement in their performance. Most of the students obtained the letter grade C/C+ when they took this course last time. It is worth mentioning here that the texts that they read last time were not the same one they studied this semester. And the difficulty level in terms of language and length of the stories have been kept similar.

Score Chart of the Students by Mean Score
Class Attendance = 96% (4.8/5)
Class Performance = 90% (4.5/5)
Quiz = 60% (6/10)
Class Test = 66 % (6.6/10)
Assignment = 68.5% (6.85/10)
Presentation = 65% (6.5/10)
Midterm = 65% (13/20)
Final = 62% (18.5/30)

The mean score of the formative assessments clearly show a development in the students' performance in comparison to their previous results and the final score establishes the fact that the CRAS has played a positive role in the students' result. The percentage of the midterm and final exams, however, does not give the real picture of the development as two of the students did not perform well in their midterm and final exam.

After they completed the classes of this course for the semester they were given a questionnaire to document their experience and their opinion about the learning experience. The following is the result of the questionnaire:

	Disagree	Not Sure	Partly Agree	Agree	Strongly Agree
Instruction was clear	0	0	0	7	23
The content was interesting	1	0	0		29
Learning process was collaborative	1	0	0	0	29
Learning process was interesting and effective	1	1	0	0	28
Notes/Points provided by the instructor were helpful	0	0	1	4	25
Scope of class participation was sufficient	0	0	1	4	25
Mode of providing feedback was effective	1	0	0	5	24
Tasks were effective	1	0	0	0	29
Use of technology was justified	1	1	0	0	28
Total (N)= 30					

From the data it is evident that almost all the students (96.67%) unanimously agree that the learning is collaborative, interesting and effective for them. They have accepted the peer feedback and have come away from the traditional mode of instructor-only-feedback. This has also promoted learner autonomy in the class while the students were managing their own study and providing feedback to their peers.

8. Limitations of the Study and Scope of Further Research
One of the striking limitations of the study is that it does not include a control group. So, the quantitative data may be claimed to be inconclusive. A comparative study between an experimental group and a control group may yield more insightful data regarding the inclusion of CRAS. Besides, the sample size is also small and may have an impact on the data. It should also be noted that the proceedings of the focus group discussion and the questionnaire had been collected before the final exam that might have impacted the opinion and data provided in both. The class size, amenities and socio-economic background of the registered students of the course have not been considered while recording the data. This might play a role in a different situation like the situation in the public universities of Bangladesh where the usual class size is more than 100. So, whether or not the inclusion of CRAS is feasible in tertiary level in Bangladesh calls for further research. Moreover, since reading attitudes and strategies may well vary from reader to reader, future studies may be designed keeping in mind the variables influenced by learner differences, period of learning, and taking other groups from different levels of tertiary education.

9. Conclusion
Collaborative Reading Annotation System is completely new experience for the students of our country. The evidence extracted from the research proves that it is a promising inclusion for the pedagogical innovation and improvement. CRAS can be an effective tool to facilitate L2 reading comprehension in a digital reading environment. The ever-growing proof of the relationship of collaborative learning and digital literacy indicate that ESL/EFL learners can benefit from this new pedagogical system. This breaks the conventional notion of classroom activities and performance and actively includes and tracks the out-of-class involvement of the learners in a lesson. Though the study encompasses a small group of a private university of Bangladesh, as a pilot project, this can be a stepping stone to work on this aspect of teaching and learning and can open a new vista of knowledge to further the research on second language reading.

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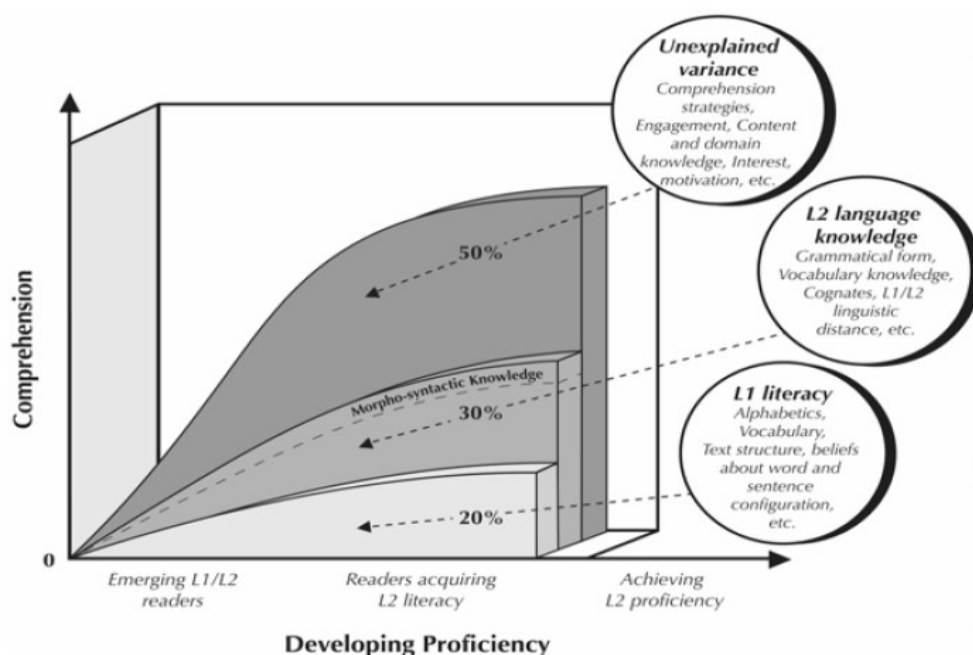
Appendix 1

Figure 1. Berhardt's compensatory model of second language reading

Appendix 2

Grading Policy as per University Grants Commission of Bangladesh (UGC)'s regulation:

Marks	Grade	Grade Points
80+	A+	4.00
75-79.99	A	3.75
70-74.99	A-	3.50
65-69.99	B+	3.25
60-64.99	B	3.00
55-59.99	B-	2.75
50-54.99	C+	2.50
45-49.99	C	2.25
40-44.99	D	2.00
Below 40	F	0.00

Appendix 3
Score chart of each student (Std.):

	Std. 1	Std. 2	Std. 3	Std. 4	Std. 5	Std. 6	Std. 7	Std. 8	Std. 9	Std. 10
Attendance	4	5	5	5	5	5	5	5	3	4
Performance	3	4	4	4	4	4	4	4.5	2.5	4
Quiz*	4	6.5	6	6	7	7.5	6.5	6	4.5	6
Class Test**	5	6	6	6.5	7.5	7	7.5	6.5	5	6.5
Assignment	5.5	7.5	7.5	7	7.5	6.5	6.5	7	6	6
Presentation	5	6	6	6	6	6.5	6.5	6	6	6
Midterm	10	13	12	14	13	12	12.5	13	13	13
Final	15	17.5	17	18	18	19	19	19	13.5	17.5
Total score	51.5	65.5	63.5	66.5	68	67.5	67.5	67	53.5	63
Letter Grade	C+	B+	B	B+	B+	B+	B+	B+	C+	B
Previous Letter Grade	C+	C+	C	C	C+	C+	C+	C+	C+	C+

	Std.11	Std.12	Std.13	Std. 14	Std. 15	Std.16	Std.17	Std. 18	Std.19	Std. 20
Attendance	4.5	4.5	4.5	4.5	4.5	5	5	5	5	5
Performance	4	4	4	4	4	4.5	4	4	4.5	4.5
Quiz*	5	5.5	6.5	6.5	6	6.5	5.5	6.5	6.5	7
Class Test**	6	6.5	7.5	7.5	7.5	7	7	6	6.5	6.5
Assignment	6.5	6.5	7	7	7	7	6.5	7.5	7	7
Presentation	6	6.5	6.5	7	6.5	7	7	6.5	6.5	6.5
Midterm	13	13	14	13.5	12.5	14	14	13.5	13.5	14
Final	17	18.5	18	20	19.5	19.5	19	18.5	19	20
Total score	62	65	68	70	67.5	70.5	68	67.5	68.5	70.5
Letter Grade	B	B+	B+	A-	B+	A-	B+	B+	B+	A-
Previous Letter Grade	C+	C	C	B-	C+	B-	C+	C	C	B-

	Std. 21	Std.22	Std.23	Std.24	Std.25	Std.26	Std.27	Std.28	Std. 29	Std. 30
Attendance	5	5	5	5	5	5	5	5	5	5
Performance	4	4	4	4.5	4.5	3.5	4.5	4	4	4
Quiz*	7.5	6	6	6	6.5	5.5	6.5	6	6	6.5
Class Test**	6.5	7	6	7.5	8	7	6	6.5	6.5	6.5
Assignment	7	7	6.5	7.5	8.5	7	7.5	6.5	6.5	6.5
Presentation	7	7.5	7.5	6.5	7.5	6.5	6.5	6.5	6	7
Midterm	12.5	11.5	14	12	13.5	13	14	13	13	12.5
Final	21	20	18.5	19	21.5	18.5	19.5	19	18	19.5
Total score	70.5	68	67.5	68	75	66	68	66.5	67	67.5
Letter Grade	A-	B+	B+	B+	A	B+	B+	B+	B+	B+
Previous Letter Grade	C+	C+	C+	C+	B-	C	C	C	C+	C+

*mean of three quizzes **mean of two tests

Appendix 4
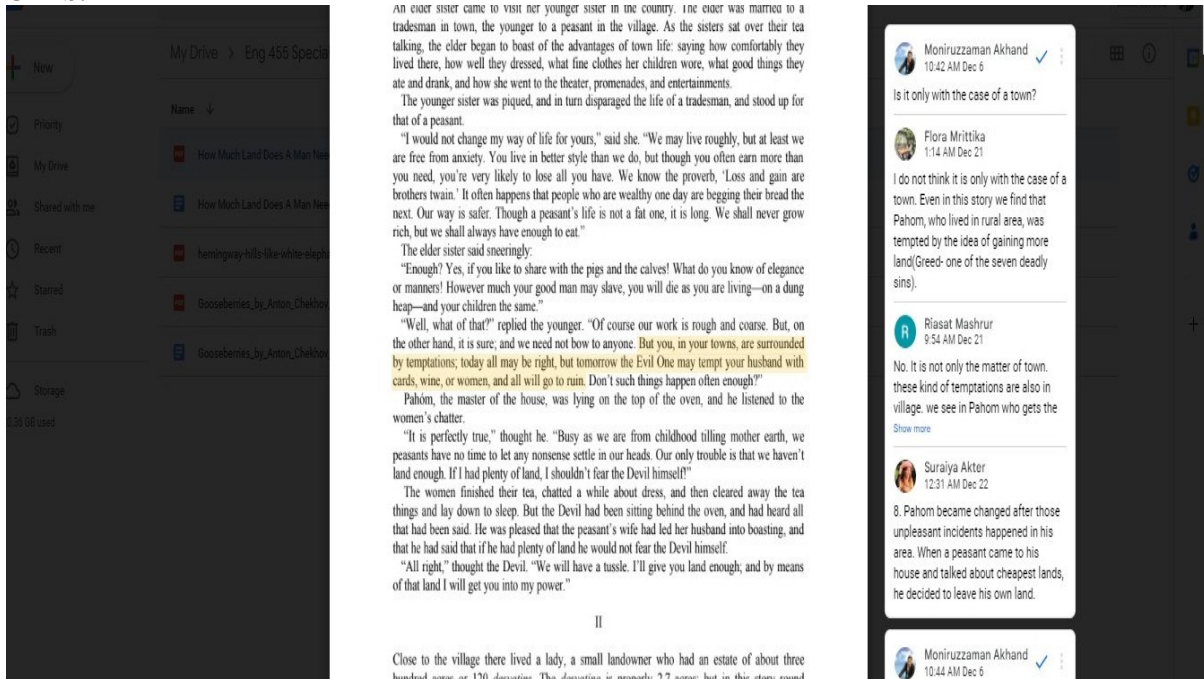**Samples of the**
CRAS:

Figure 2. Example of making associations, constructing mental images, activation prior knowledge
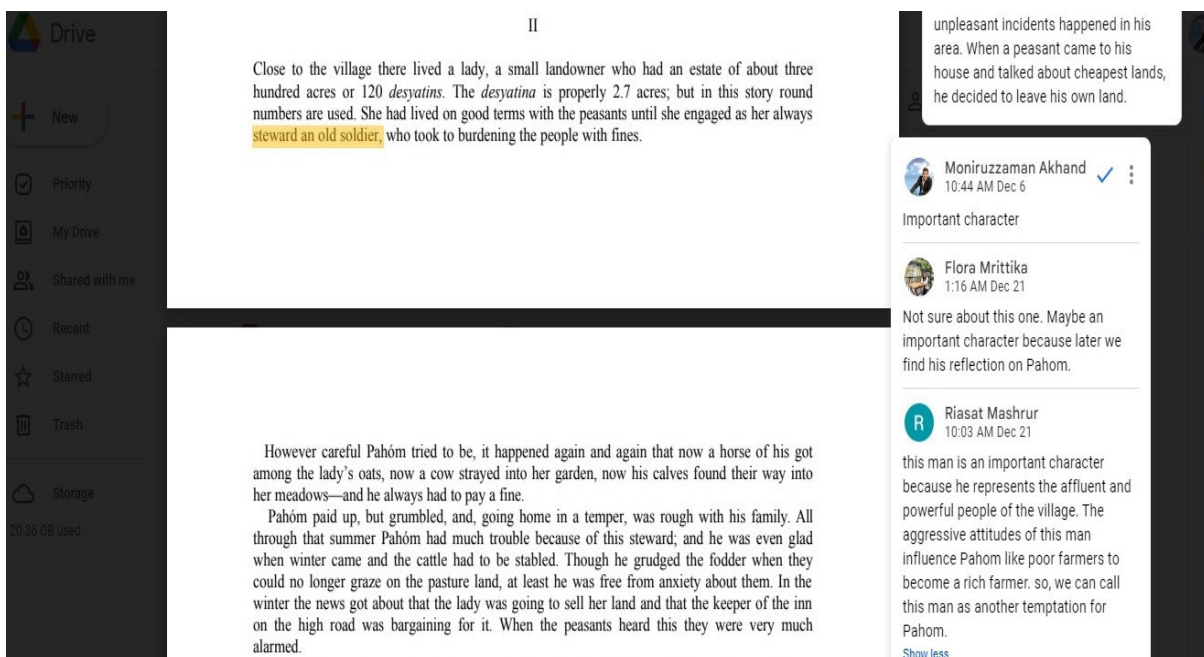

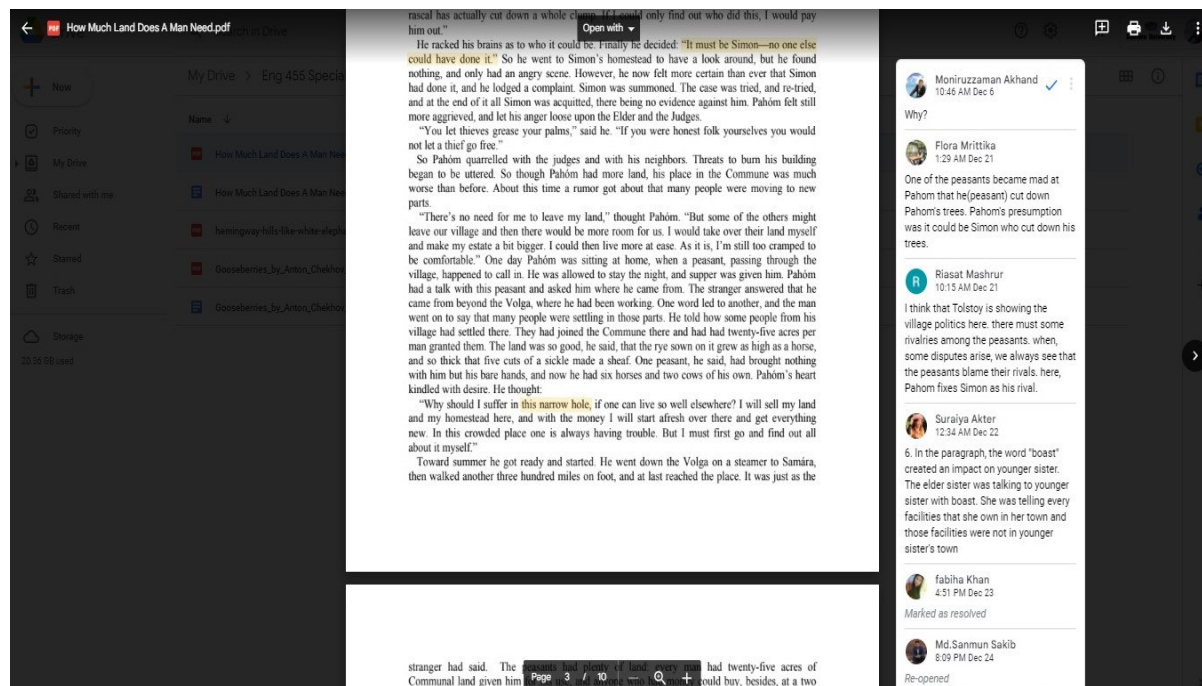Figure 3. Example of forming questions, answering questions and elaborative interrogations

Figure 4. Example of previewing, rereading, concentrating