PORTRAIT OF INDONESIAN AND PAKISTAN EFL STUDENTS' ENGAGEMENT IN ONLINE CLASSROOM BASED ON NEUROSCIENCE APPROACH

by Turnitin LLC

PORTRAIT OF INDONESIAN AND PAKISTAN EFL STUDENTS' ENGAGEMENT IN ONLINE CLASSROOM BASED ON NEUROSCIENCE APPROACH

[1*]Rukminingsih, [1]Hartia Novianti, [2]Muhammad Anees, [3]Nala Sita Rukmi

[1]English Language Education, STKIP PGRI Jombang , Jombang Indonesia
[2]Government College Peshawar, Pakistan
[3]English Language Education, Yogyakarta State University, Jogyakarta, Indonesia

*Corresponding Author Email: : rukminingsih19@yahoo.co.id

Article Info	Abstract
Article History Received: November 2023 Revised: December 2023 Published: January 2024 **Keywords** *Neuroscience approach;* *Onlineclassroom;* *Students' engagement.*	*The integration of neuroscience principles in online teaching can enhance student engagement and create a more engaging and brain-friendly learning experience. This study aims to portray the comparison of Indonesian and Pakistan EFL students' behaviour, cognitive and emotional engagement in online classroom based on neuroscience approach. The participants in this research were students from Indonesian and Pakistan EFL students. The purposive sampling was used to select the participants who were taking from students of STKIP PGRI Jombang of English language education students from Indonesia and students of Government College Peshawar, Pakistan. This study employed a mixed case study by using a quantitative and qualitative data. The instruments of this study were close- ended and open-ended questionnaires. close-ended questionnaire. The quantitative data was analyzed by using descriptive statistics and the qualitative data was analyzed by thematic analysis. The findings showed that online learning in Indonesia and Pakistan shown to have positive levels of behavioral, cognitive and emotional engagement. The most positive engagement from both Indonesia and Pakistan students was behavioral engagement. Then, students' cognitive engagement was more positive than emotional engagement. Then the finding also showed that the students engagement in Pakistan students was high positive level than Indonesia students.*

INTRODUCTION

The outbreak of the Covid 19 pandemic has changed multiple aspects, one of which is the educational environment. The Covid-19 pandemic has forced all educators and students in Indonesia and Pakistan to improve their use of online learning technologies. Citizens in Indonesia are encouraged to "Work from Home (WFH)" and to engage in "Social Distancing" (Nala et al., 2021; Rukminingsih et al., 2021 & Rukminingsih et al., 2020). The Pakistani government has even implemented a lockdown system (Abid et al., 2021; Adnan et al., 2020 & Mukhtar et al., 2020). This forces lecturers and students, whether they are ready or not, to keep up with the development of technology in the implementation of digital learning. As consequently, they must perform online learning and teaching as the most appropriate solution for the teaching and learning process.

The transition to online learning necessitates changes to the teaching and learning strategies that were previously connected with university learning environments. According to Burns et al. (2018) and Collie et al. (2017) the significance of flexibility in online learning

is determined involvement, education, and achievement. online environment is Correlations have been found between students' grades and the materials used in online environments as well as between students' emotional and intellectual investment in online learning (Pittaway & Moss, 2014). These two factors are thus critical considerations for course design and pedagogy for lecturers looking to increase online students' engagement.

Students' engagement in online learning is an important aspect in achieving good learning outcomes because it represents their involvement, interest, and motivation in the learning process. Measuring and improving students' involvement in online learning, on the other hand, can be difficult because online learning environments can present different hurdles and opportunities than traditional classrooms. According to Moreira et al. (2020), student engagement could be divided into three categories: emotional (how they feel), cognitive (how they think), and behavioral (how they act). According to Wang et al. (2015), behavioral engagement refers to students' commitment to adhering to the norms established by the instructors presenting the course, whereas emotional engagement is related to their interest in and sentiments about the course. Students demonstrate cognitive engagement, on the other hand, when they put in the effort to interact with the course's learning materials.

Several researchers have looked into how neuroscience methodologies and technologies might be used to better understand and improve students' involvement in online learning. The study of the structure and function of the nervous system, particularly the brain, and how it connects to behavioural, cognition, and emotion engagement is known as neuroscience (Riva, 2021; Rukminingsih et al., 2021 & Garcia-Monge, 2020). The engagement of students causes neurochemical changes in the brain. According Colvin (2016) and Brockington et al.(2018) when a student is engaged and motivated, the brain releases neurochemicals that enable brain plasticity during learning. Neurochemicals are not released when students are disengaged, inattentive, distracted, or doing anything that does not demand some effort. Furthermore, students' engagement can be seen by cognitive, emotional, or verbal behavior.

Behavioral engagement is defined as student conduct on a learning assignment that includes student persistence, effort, and contribution to their own learning. According to recent research, behavioral engagement is described as student participation, effort, attention, persistence, and positive behavior toward the learning activity (Fredricks et al., 2016). Wang et al. (2016) characterize it in terms of asking and responding questions, involvement, persistence or giving up easy, and not paying attention within the context of a domain specific interaction. Despite the fact that the concept of behavioral engagement is well developed and has been explored in many studies in face-to-face contexts, student behavioral are found to be different in online settings (Louwrens & Hartnett, 2015). This unusual conduct in online contexts has received less attention in the past, and our study looks at it in the absence of teacher and peer support. In this research, behavioral engagement involves the levels of Interest, enthusiasm, classroom interaction, classroom participation adapted from Dwivedi et al. (2019).

In this study, the students' cognitive engagement in their learning was carried out on the online course using the Whatsapp, Google classroom Zoom Cloud and their level of cognitive engagement based on Casimiro's level. Casmiro (2016) argued that the student's cognitive engagement was observed through their conversations in Zoom and Whatsapp and Google Classroom discussion in chats. According to Kew & Tasir (2021) cognitive engagement refers to how much mental effort students put in the assigned learning activities or how much work they exert in intellectual tasks. Thus, this study looks into the comments made by students in online forums as such as in Google classroom, Google meet and Zoom. In this study, cognitive engagement involves the levels of attention, strategizing, reflection and self -regulation, comprehension adapted from Dwivedi et al. (2019).

In addition to focusing on student access to information and course design, educators must also encourage social and collaborative interaction to ensure students feel emotionally involved inside the course. Emotional engagement, according to Reyes-Fournier et al. (2021) is a critical component of online teaching engagement. Students' emotional involvement in online learning refers to how interested, motivated, and excited they are about their online courses. It also includes the good and negative emotions that students have about their online learning environment, such as delight, interest, boredom Sinatra et al. (2015).

Teachers should facilitate students' emotional engagement by making them feel connected and supported in their online studies. Krause & Coates (2018) argued that teachers play an important role in increasing student retention and helping them fully engage in their academic degree program by finding ways to interact with students and foster connections between students and their classmates. In this research, emotional engagement involves the levels of enjoyment, boredom and frustration adapted from Dwivedi et al. (2019). Neuroscience has been shown to significantly increase students' engagement in higher education (Ruisoto & Juanes, 2019).

Based on the pre research and previous studies, there is no research which see the students' engagement related to neuroscience approach. It prompts researchers to conduct a study dealing with emotional, behavior and cognitive engagement in online language learning based on neuroscience approach. Thus, the current research will fill up the research gaps the students' engagement between two countries, Indonesian and Pakistan EFL based on neuroscience approach.   This study is addressed to answer the two research questions, involving (1). How is Indonesia EFL students' emotion, behavior and cognitive engagement in online language learning based on neurocognitive approach? and (2) How is Pakistan EFL students' emotion, behavioral   and cognitive engagement in online language learning based on neurocognitive approach?

RESEARCH METHOD
Research Design

The research design adopted for this study is characterized as a descriptive case study, a methodological framework chosen to illuminate and delineate the comparative analysis of emotional, behavioral, and cognitive engagement among English as a Foreign Language (EFL) students from Indonesia and Pakistan within the online classroom environment. The overarching objective of this investigation is to provide a nuanced portrayal of the specific phenomena under examination, aligning with the inherent nature of a descriptive case study (Yin, 2014; Rukminingsih et al., 2020). According to these methodological guides, a descriptive case study is fundamentally geared towards offering a detailed depiction of particular phenomena through the comprehensive integration of both quantitative and qualitative data. In adherence to this methodological paradigm, the current study employs a mixed-data approach, combining both quantitative and qualitative data sources. This methodological fusion aims to enrich the depth and breadth of the investigation, allowing for a multifaceted exploration of the intricacies inherent in the emotional, behavioral, and cognitive dimensions of engagement within the online learning context. By triangulating data from diverse sources, the research endeavors to provide a more comprehensive understanding of the intricate interplay between neurocognitive factors and students' engagement levels in online EFL classrooms, thereby contributing to the existing body of literature on effective pedagogical strategies within virtual learning environments.

Population and Sample

The demographic cohort under investigation in this research comprises English as a Foreign Language (EFL) students drawn from both Indonesian and Pakistani academic contexts. The sample size was meticulously structured to encompass a total of 34 students

each from Indonesia and Pakistan, resulting in a comprehensive and balanced representation of participants. The recruitment of participants was undertaken through purposive sampling, a methodological approach employed to deliberately select individuals with specific characteristics or attributes deemed pertinent to the research objectives. The participants selected for this study were sourced from two distinct educational institutions: STKIP PGRI Jombang, an academic institution specializing in English language education in Indonesia, and Government College Peshawar in Pakistan. This targeted selection aimed to ensure a focused and homogeneous group of participants who are actively engaged in English language education. The purposive sampling strategy, therefore, enables the researchers to capture nuanced insights into the linguistic and pedagogical experiences of EFL students in these specific academic settings, fostering a more refined and contextually relevant exploration of the research inquiry.

Instruments

The data were collected through an online close response questionnaire and open response questionnaire. The close and open-ended questionnaire Google Forms provided by online questionnaires. Both close and open-ended questionnaires were validated by expert judgments and were determined using construct and face validity. The reliability of the questionnaire was ascertained significantly. The data were analyzed using descriptive statistics.

Close-Ended Questionnaire

Close-response questionnaire was used to reveal students' engagement toward the implementation of online class. The research instrument consists of a questionnaire using a dichotomous scale. The items of the questionnaire are adapted from Dwivedi et al. (2019) consisting of seventeen items. The researchers employed content and construct validity of the questionnaires by expert judgments

Open- Ended Questionnaire

Open-response questionnaire was distributed to strengthen findings from close-ended questionnaires. This questionnaire employed Appleton, et al (2004) and Dwivedi et al. (2019) that student engagement three multiple behavioral (Interest, enthusiasm, classroom interaction, classroom participation), cognitive (Attention, strategizing, reflection and self - Regulation, comprehension.), and emotional categories (enjoyment, boredom and frustration). The questionnaire consists of twelve items related to their engagement during the teaching-learning process of Indonesian and Pakistan EFL students especially in reading class.

Table 1.
Three Components of Student Engagement

Behavioral	Interest, enthusiasm, classroom interaction, classroom participation.
Cognitive	Attention, strategizing, reflection & self -regulation, comprehension
Emotional	Enjoyment, boredom and frustration.

Data Analysis

The data of this study employed both a quantitative data by using close ended questionnaire and a qualitative data by using open-ended questionnaire. After gathering the data from students' close-ended questionnaire, the result was analyzed by using descriptive statistics to find out the percentage of each statement for data analysis and then was interpreted data descriptively to see the average score for each indicator of the questionnaire. The score of the questionnaire was a totaled number of options given by the participant. The data was used to describe Indonesian and Pakistan EF students' engagement in language

learning based on neurocognitive. Then, close- ended questionnaire as a qualitative data which consists of open questions was analyzed using thematic analysis to strengthen the quantitative data from close response questionnaire. The data was coded based on the indicators of students' behaviour, cognitive and emotional engagement based on neuroscience in online classroom adapted from Dwivedi et al. (2019).

RESEARCH FINDINGS AND DISCUSSION
Research Findings
The portrait of Indonesia EFL students' emotion, behaviour and cognitive engagement in online language learning based on neurocognitive approach

Based on the data from Indonesian students' engagement close-ended questionnaire and open-ended questionnaire in online learning involving students' emotion, behaviour and cognitive based on neurocognitive approach. There were 34 students who have participated in this study by answering Guttman scale as the close-ended questionnaire and open-ended questionnaire based on thematic of emotion, behaviour and cognitive engagement based on neurocognitive approach. The number of participants who answered Yes and No questionnaire and the examples of students' open -ended questionnaire could be seen in the table 2.

Table 2
Indonesian EFL Students' Behavior, Cognitive and Emotional Engagement in Online Classroom

Category and Items Behavioral Engagement	Yes	No	Examples of the students' Open ended questionnaire
Were you interested in learning activities in EFL reading class with online instruction?	31	3	was very relaxed, ready and comfortable during online reading activities by using various learning techniques.(RI 5)
Did you feel enthusiastic for attending EFL reading course through online class?	29	5	I thought online learning did not make me lazy to attend the reading course. (RI_2)
Did you discuss or do the task with your peers during online learning process?	29	5	Yes, I was free to discuss, ask estions, share different opinions with other friendsso I did not have time to chit chat in that class. (RI_6)
Could you participate actively in the classroom discussion	25	9	My lecturer always motivated her students' to share the result of their group discussion in classroom via Zoom, GC or Telegram.(RI_10)
Cognitive Engagement Did you take attention fully during the online learning process?	22	12	I followed the class without pressure and the class made me challenged. I always pay attention from opening until ending.(RI_1)
Could you perform assigned roles in EFL reading activities?	30	4	I became more active, interactive and confident during critical reading class because I mastered well the topic and felt comfortable during learning. (RI_7)
Could you respond to the lecturers' feedback?	29	5	My lecturer gave us the feedback in the end of our discussion and I sometimes still had a lot of questions dealing with my lecturer feedback. (RI_5).
Could you monitor, control and adjust your effort to achieve the learning objectives?	31	3	Yes, I could monitor and adjust to achieve the learning bjectives of EFL reading. .(RI_8).

Category and Items Behavioral Engagement	Yes	No	Examples of the students' Open ended questionnaire
Could you comprehend and retain the learning content of the topic such as summarizing, questioning and explaining?	30	4	I could understand more on the text critically because I had read some articles with the similar topic of the text given and I could do my tasks easily. (RI_3)
Emotion Engagement			
Did you enjoy the learning process during online class?	27	7	Yes, I enjoyed the learning process during my online class especially when we learned synchronously. (R1_8).
Did you not feel boredom during online class?	18	16	I sometimes felt bored during online learning especially when I must list my friend presentation only. RI_3).
Did you not feel frustrated when getting difficult critical reading tasks?	23	11	I enjoyed the class, my lecturer set her teaching very well from beginning until ending and I feel learning without pressure.(RI_3)

The tables above showed that students taught by combining BTT and CS activation strategy with online instruction had a positive engagement in its implementation for a critical reading class. Students' emotion engagement captures students' affective responses and feeling toward online learning, students' behaviour engagement refers to observable actions and participation during online learning and students' cognitive engagement focuses on mental processes and thinking during learning.

Based on the summary from Indonesian students' engagement close-ended questionnaire and open-ended questionnaire in online learning involving students' emotion, behaviour and cognitive based on neurocognitive approach. There were 34 students who have participated in this study by answering Guttman scale as the close-ended questionnaire and open-ended questionnaire based on thematic of emotion, behaviour and cognitive engagement based on neurocognitive approach. The percentage of participants who answered Yes and No questionnaire and the examples of students' open -ended questionnaire could be seen in the table 3.

Table 3
Summary of Indonesian EFL Students' Behaviour, Cognitive and Emotional Engagement Online Classroom

Category and Items Behavioral Engagement	Yes	No	Examples of the students' Open ended questionnaire
Interested	92%	8%	I Almost all of the students were interested in joining online class because students more freedom to study at their own speed, which enhances learning and fosters stronger relationships with teachers. However, some students are not interested in online learning because of the few opportunities for engagement, erratic sound and visual quality due to reliance on Internet quality, and inadequate technological infrastructure.
Enthusiasm	85%	15%	almost of the students were enthusiasm in online reading class by using various online platforms and students' active participation in class debates, enthusiasm for learning, desire to work with peers, and general enthusiasm for the subject matter
Classroom interaction	85%	15%	Almost of the students interacted actively. They were free to discuss, ask question, share different opinions with other friends.
4. Classroom participation	73%	27%	Almost all of the students actively engaged in the online learning process because they had a wealth of prior knowledge. Additionally, the lecturer constantly encouraged

Category and Items Behavioral Engagement	Yes	No	Examples of the students' Open ended questionnaire
			the students to use Zoom, Google Classroom, or Telegram to share the outcomes of their group discussions in class.
Cognitive Engagement			
Attention	64%	36%	Not all of the students had a good attention during online learning because of many factors, such as, wifi connection sometime made them distracted their concentration, But some students without wifi connection distraction, they followed without pressure. The lecturer taught students by using synchronous to pose a comprehension question, she gauged her students' understanding of the material and determine whether further review is necessary. They can also decide what the lecturer should say to draw them in and keep them interested.
Strategizing	88%	12%	Students participated actively in online class discussions by offering their ideas, asking questions, and reacting to their classmates. They efficiently manage their time by making a calendar to help them stay organized and complete their assignments on time, as well as by setting clear goals for each study session and tracking their progress.
Reflection	85%	15%	Students reflect on and assess their own learning experiences. It allows them to obtain a better comprehension of the material. Students completed peer reviews, and self-assessments. These activities urge students to consider their learning process critically and to draw links between theory and practice.
Self-Regulation	91%	9%	The students have great self-regulation to manage their behaviour, thoughts, and emotions appropriately through self-monitoring and self -assessment.
Comprehension the material	88%	12%	students could comprehend the materials given by their lecturer because the material given by the lecture was authentic so the students could comprehend the materials because the topic was familiar for them so it helped them more easily understood the content.
Emotion Engagement			
Enjoyment	79%	21%	Almost of the students felt that online class was real enjoyable class especially when we learned synchronously, but some students said that they felt nervous when they had to be active in Zoom, but they preferred to learn asynchronously.
Not Boredom	51%	49%	Some of the students felt bored in online class because they had to sit and face to their laptop for hours.
.Not Frustration	61%	39%	Some students did not feel frustrated because the lecturer set her teaching style very well from beginning to end, but a few students did feel frustrated whenever they met a Wifi connection difficulty.

Based on the table 3 firstly, it described students' engagement dealing with behavior engagement consisting of focusing on Interest, enthusiasm, classroom interaction, classroom participation the class had positive engagement. It showed 92% of the students were interested in joining online class because students more freedom to study at their own speed, which enhances learning and fosters stronger relationships with teachers. However, some students are not interested in online learning because of the few opportunities for

engagement, erratic sound and visual quality due to reliance on Internet quality, and inadequate technological infrastructure. Almost of the students were enthusiasm in online class. It could be proved that 85 % of students were enthusiasm in online reading class by using various online platforms and students' active participation in class debates, enthusiasm for learning, desire to work with peers, and general enthusiasm for the subject matter. In the classroom interaction, almost student got good interaction in online class. There were 85 % students were active to interact within with their peers and lecturer. They were free to discuss, ask question, share different opinions with other friends. Almost of the students participated actively during learning process in online platform because they felt that the class was comfort. It could be proved that 73% of students responded positive participation in their online class. Almost all of the students actively engaged in the online learning process. Additionally, the lecturer constantly encouraged the students to use Zoom, Google Classroom, or Telegram to share the outcomes of their group discussions in class.

Secondly, it described students' engagement dealing with cognitive engagement consisting of attention, strategizing, reflection and self -Regulation, comprehension. Almost all of the students had positive cognitive engagement. More than half of the students had good attention in online class. It can be proved that 64% students paid attention during online class, however, not all of the students had a good attention during online learning because of many factors, such as, Wifi connection sometime made them distracted their concentration, But some students without Wifi connection distraction, they followed without pressure. Almost of the students had good strategizing in online class. It can be proved that 88% Students participated actively in online class discussions by offering their ideas, asking questions, and reacting to their classmates. It showed 85 % of the students evaluated and reflected on their own learning experiences. It enables students to gain a deeper understanding of the content. Students performed peer reviews and self-evaluations. These activities encourage students to think critically about their learning process and to make connections between theory and practice.

Almost of the students had a great self-regulation in their online class. It could be proved that 91% of the students could determine their learning objectives by self-monitoring and adjusting to achieve their course with online instruction. They were able to set goals, choose appropriate strategies, monitor their progress, and adjust their actions based on lecture's feedback and their portfolio. Most of the students could comprehend the materials during online class. It could be proved that 81 % of students could comprehend the materials given by their lecturer because the material given by the lecture was authentic so the students could comprehend the materials because the topic was familiar for them so it helped them more easily understood the content.

Thirdly, it described students' engagement dealing with emotional engagement consisting of enjoyment, boredom and frustration. Almost of the students could enjoy their online learning. It could be proved that 79 % of the students felt that online class was real enjoyable class especially when we learned synchronously, but some students said that they felt nervous when they had to be active in Zoom, but they preferred to learn asynchronously. However, the students' boredom also increased during online class. It could be proved that 51% felt bored in online class because they had to sit and face to their laptop for hours. The online class sometimes made them sleepy. Many students also sometimes got frustration during online class but some students did not feel frustration. It could be seen that 60% of the students did not feel frustrated because the lecturer set her teaching style very well from beginning to end, but a few students did feel frustrated whenever they met a Wifi connection difficulty.

The portrait of Pakistan EFL students' emotion, behaviour and cognitive engagement in online language learning based on neurocognitive approach

Based on the data from Pakistan students' engagement close-ended questionnaire and open-ended questionnaire in online learning involving students' emotion, behaviour and cognitive based on neurocognitive approach. There were 34 students who have participated in this study by answering Guttman scale as the close-ended questionnaire and open-ended questionnaire based on thematic of emotion, behaviour and cognitive engagement based on neurocognitive approach. The number of participants who answered Yes and No questionnaire and the examples of students' open -ended questionnaire could be seen in the table 4.

Table 4

Pakistan EFL Students' Behavior, Cognitive and Emotional Engagement in Online Classroom

Category and Items	Yes	No	Examples of the students' Open ended questionnaire
Behavioral Engagement			
Were you interested in learningactivities in EFL reading class with online instruction?	29	1	I found that online learning made the course more effective because we did not need to go out during Covid 19
Did you feel enthusiastic for attending EFL reading course through online class?	29	5	I thought online learning did not make me lazy to attend the reading course. (RI_2)
Did you discuss or do the task with your peers during online learning process?	29	1	I used to discuss and share the opinion during online learning, the lecturer gave us more time to discuss with our peers (RI_6))
Could you participate actively in the classroom discussion?	25	5	I had to be active during in online class. I usually gave respond to my friend's presentation in Zoom and I also participated to give my opinion. (RI_10)
Cognitive Engagement			
Did you take attention fully during the online learning process?	22	8	I tried to take fully attention during online class but sometimes wifi connection distracted my concentration (RI_1)
Could you perform assigned roles in EFL reading activities?	25	5	I did all instructions given by my lecture during online learning both synchronous and asynchronous. (RI_7)
Could you respond to the lecturers' feedback?	29	1	My lecturer gave us the feedback in the end of our discussion and I sometimes still had a lot of questions dealing with my lecturer' feedback. (RI_5)
Could you monitor, control and adjust your effort to achieve the learning objectives?	27	3	My goal for learning was to achieve the learning objectives of EFL reading. .(RI_8).
Could you comprehend and retain the learning content of the topic such as summarizing, questioning and explaining?	30	4	I could understand the material well because my lecture always gave her online class some enforcement after her feedback. (RI_3)
Emotion Engagement			
Did you enjoy the learning process during online class?	21	9	I followed the online class with fun because the environment of online class did not make us feel pressure(R!_8).
Did you not feel boredom during online class?	20	10	I sometimes felt bored during online learning especially when I must my lecturer was not clear instruction. RI_3).
Did you not feel frustrated when getting difficult critical reading tasks?	17	13	I felt frustrated in online learning if my Wifi connection was not good. (RI_3)

Based on the summary from Pakistan   students' engagement close-ended questionnaire and open-ended questionnaire in online learning involving students' emotion,

behaviour and cognitive based on neurocognitive approach. There were 34 students who have participated in this study by answering Guttman scale as the close-ended questionnaire and open-ended questionnaire based on thematic of emotion, behaviour and cognitive engagement based on neurocognitive approach. The percentage of participants who answered Yes and No questionnaire and the examples of students' open -ended questionnaire could be seen in the table 3.

Table 5
Summary of Pakistan EFL Students' Behavior, Cognitive andEmotional Engagement in Online Classroom

Category and Items	Yes	No	Examples of the students' Open ended questionnaire
Behavioral Engagement			
Interested	96%	4%	Almost all of the students were interested in joining online class because the lecturer could create positive online classroom atmosphere.
Enthusiasm	85%	15%	almost of the students were enthusiasm in online class. It could be proved the students responded positive enthusiasm in their online class.
Classroom interaction	85%	14%	Almost of the students showed their responses that They were free to discuss, ask question, share different opinions with other friends.
Classroom participation	93%	5%	Almost of the students participated actively during learning process in online platform because they felt that the class was comfort. Moreover, the - lecturer always motivated her students to share the result of their group discussion in various platforms.
Cognitive Engagement			
Attention	83%	17%	Not all of the students had a good attention during online learning because of many factors, such as, wifi connection sometime made them distracted their concentration, But some students without wifi connection distraction, they followed without pressure.
Strategizing	90%	10%	Almost of the students were very active to respond the learning classroom activities. They asked anything to the lecturer They felt free to ask, share and argue their opinion.
Reflection	93%	7%	Almost of the students sounded that they got feedback from the lecturer both for their tasks and discussion during online class before the teacher gave enforcement.
Self-Regulation	91%	9%	Almost of the students could determine their learning objectives by self-monitoring and adjusting to achieve their course with online instruction. They were able to set goals, choose appropriate strategies, monitor their progress, and adjust their actions based on lecture's feedback and their portfolio.
Comprehension the material	94%	6%	Almost of the students felt that they could comprehend the materials given by their lecturer because the material had been posted to their online platform before their online class so the students could read before. .
Emotion Engagement			
Enjoyment	80%	20%	Almost of the students felt that online class was real enjoyable class especially when we learned synchronously, but some students said that they felt nervous when they had to be active in Zoom.
Not Boredom	70%	30%	Some of the students felt bored in online class because they had to sit and face to their laptop for hours. The online class sometimes made them sleepy.
Not Frustration	60%	40%	Some students felt their lecturer set her teaching technique very well from beginning until ending but some of the students a few felt frustrated whenever they got the Wifi connection problem.

Based on the table 3 firstly, it described students' engagement dealing with behavior engagement consisting of focusing on Interest, enthusiasm, classroom interaction, classroom participation the class had positive engagement. It showed 96% of the students were interested in joining reading class because almost all of the students were interested in joining online class because the lecturer could create positive online classroom atmosphere. Almost

of the students interacted actively. Almost of the students were enthusiasm in online class. It could be proved that 85 % of students responded positive enthusiasm in their online class. Almost of the students had good interaction in the class. It can be proved that 85 % of students were free to discuss, ask question, share different opinions with other friends. Almost of the students participated actively during learning process in online platform because they felt that the class was comfort. It could be proved that 93% of students responded positive participation in their online class. Moreover, the - lecturer always motivated her students to share the result of their group discussion in various platforms.

Secondly, it described students' engagement dealing with cognitive engagement consisting of attention, strategizing, reflection and self -Regulation, comprehension. Almost all of the students had positive cognitive engagement. Almost of the students had good attention in online class. It can be proved that 83% students paid attention during online class, however, not all of the students had a good attention during online learning because of many factors, such as, Wifi connection sometime made them distracted their concentration, But some students without Wifi connection distraction, they followed without pressure. Almost of the students had good strategizing in online class. It can be proved that 90% were very active to respond the learning classroom activities. They asked many questions to the lecturer They felt free to ask, share and argue their opinion. Almost of the students did reflection in their online class. It showed 93% of the students got the reflection from their lecturer during their online class both for their tasks and discussion before the teacher gave enforcement. Almost of the students had a great self-regulation in their online class. It could be proved that 91% had great self-regulation to manage their behavior, thoughts, and emotions appropriately through self-monitoring and self -assessment. Most of the students could comprehend the materials during online class. It could be proved that 81 % of students could comprehend the materials given by their lecturer because the material had been posted to their online platform before their online class so the students could read before.

Thirdly, it described students' engagement dealing with emotional engagement consisting of enjoyment, boredom and frustration. Almost of the students could enjoy their online learning. It could be proved that 80% of the students felt that online class was real enjoyable class especially when we learned synchronously, but some students said that they felt nervous when they had to be active in Zoom. However, the students' boredom also increased during online class. It could be proved that 70% felt bored in online class because they had to sit and face to their laptop for hours. The online class sometimes made them sleepy. Many students also sometimes got frustration during online class but some students did not feel frustration. It could be proved that 60 % of the students did not felt frustration because lecturer set her teaching technique very well from beginning until ending but some of the students felt frustrated whenever they got the Wifi connection problem.

A comprehensive analysis of the engagement levels of Indonesian and Pakistani students was undertaken through the administration of a close-ended questionnaire, specifically designed to gauge students' behavior within the ambit of a neurocognitive approach. The study enlisted the participation of 34 students from Indonesia and an equivalent number from Pakistan, collectively forming a substantive sample size for this comparative investigation. The questionnaire, anchored in the Guttman scale, was meticulously crafted to encapsulate the thematic nuances of behavior predicated on the neurocognitive framework. The dataset generated from the questionnaire responses was subjected to a meticulous tabulation, revealing the proportion of participants who provided affirmative ("Yes") or negative ("No") responses. The quantitative distribution of these responses is presented comprehensively in Table 6, affording a granular insight into the prevalence and divergence of behavioral patterns within the studied cohort. This quantitative representation serves as a foundational

framework for subsequent inferential analyses, enabling a systematic examination of the neurocognitive underpinnings influencing the behavioral engagement of Indonesian and Pakistani students within the educational context.

Table 6
Summary of the comparation between Indonesia and Pakistan EFL Students' Behavioral Engagement in Online Classroom

Behavioral	Indonesia EFL Students		Pakistan EFL Students	
	Yes %	No %	Yes %	No %
Interest	92	8	96	4
Enthusiasm	85	15	85	14
Classroom interaction	85	15	85	14
Classroom participation	73	27	93	5
Total	84	16	89	11

Based on the summary comparation between Indonesian and Pakistan students' engagement close-ended questionnaire involving students' cognitive based on neurocognitive approach. There were 34 students from Indonesia and 34 students from Pakistan who have participated in this study by answering Guttman scale as the close-ended questionnaire based on thematic of emotion, behaviour and cognitive engagement based on neurocognitive approach. The percentage of participants who answered Yes and No questionnaire could be seen in the table 6.

Based on the summary comparation between Indonesian and Pakistan students' engagement close-ended questionnaire involving students' cognitive based on neurocognitive approach. There were 34 students from Indonesia and 34 students from Pakistan who have participated in this study by answering Guttman scale as the close-ended questionnaire based on thematic of cognitive engagement based on neurocognitive approach. The percentage of participants who answered Yes and No questionnaire and could be seen in the table 7.

Table 7
Summary of the comparation between Indonesia and Pakistan EFL Students' Cognitive Engagement in Online Classroom

Cognitive	Indonesia EFL Students		Pakistan EFL Students	
	Yes %	No %	Yes %	No %
Attention	64	36	83	17
Strategizing	88	12	90	10
Reflection	85	15	86	14
Self-Regulation	91	9	91	9
Comprehension	83	12	94	6
Total	82	18	88	12

Based on the summary comparation between Indonesian and Pakistan students' engagement close-ended questionnaire involving students' emotional based on neurocognitive approach. There were 34 students from Indonesia and 34 students from Pakistan who have participated in this study by answering Guttman scale as the close-ended questionnaire based on thematic of emotion based on neurocognitive approach. The

percentage of participants who answered Yes and No questionnaire and could be seen in the table 8.

Table 8
Summary of the comparation between Indonesia and PakistanEFL Students'
Emotional   Engagement in Online Classroom

Emotional	Indonesia EFL Students		Pakistan EFL Students	
	Yes %	No %	Yes %	No %
Enjoyment	80	20	79	21
Not boredom	30	70	49	51
Not Frustration	40	60	39	61
Total	50	50	56	44
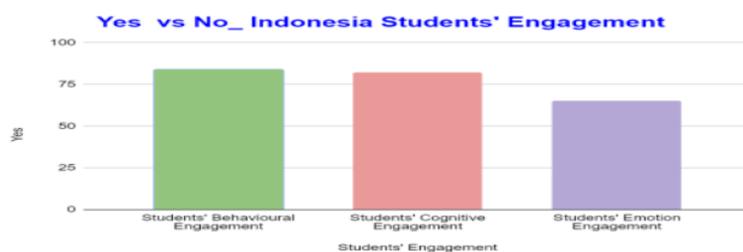
Figure 1. Summary of Indonesia Students' Engagement

Figure 1 visually encapsulates the differential responses obtained from Indonesian students concerning their engagement in online learning. Notably, the highest affirmative responses (Yes) were registered in the domain of behavioral engagement, indicating a pronounced inclination towards active participation and interaction in the virtual learning milieu. In contrast, the lowest affirmative responses were observed in the realm of emotional engagement, underscoring a comparatively lower manifestation of affective involvement among Indonesian students within the online learning paradigm. Further analysis of the data delineates a hierarchy within the facets of engagement, with cognitive engagement ranking higher than emotional engagement. This observed pattern suggests a predilection among Indonesian students for intellectual involvement and cognitive processes over emotional dimensions in the context of online learning. Additionally, it is noteworthy that behavioral engagement received the lowest affirmative responses among the three domains, implying that comparatively, Indonesian students exhibited a lesser degree of behavioral involvement in the online learning environment. The nuanced insights derived from Figure 1 provide a foundation for a more in-depth exploration of the intricate dynamics characterizing students' engagement patterns within the specific context of online learning. Subsequent statistical analyses and interpretation can further elucidate the underlying factors contributing to these observed trends, thereby enriching the understanding of the multifaceted nature of student engagement in virtual educational settings.
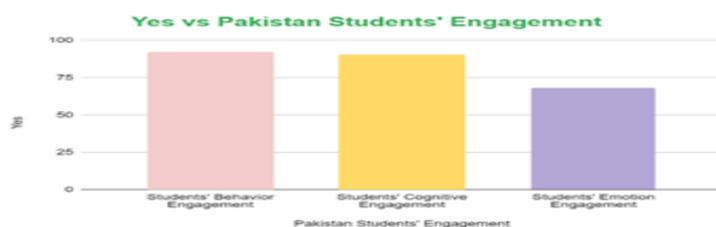
Figure 2. Summary of Pakistan Students' Engagement

Figure 1 depicted Pakistan students with the highest response of Yes is students' behavior engagement in online learning and the lowest response of Yes is students' emotion engagement while students' cognitive engagement is higher than students; emotion engagement and students' behavioral is lowest   among behavioral and cognitive engagement.

Discussion

This study examined the case of higher school students in Indonesia and Pakistan engagement during Covid 19 pandemic and focused on   the behavioral, cognitive and emotional students' engagement during online learning. Both of Indonesia and Pakistan students had positive engagement. Students' participation in online learning is critical to achieving high learning outcomes because it reveals their involvement, interest, and motivation in the learning process. Measuring and boosting students' participation in online learning, on the other hand, can be challenging because online learning environments present distinct challenges and opportunities than traditional classrooms. Moreira et al. (2020) classified student participation into three categories: emotional (how they feel), cognitive (how they think), and behavioral (how they act). Wang et al. (2015) define behavioral engagement as students' commitment to the standards established by the instructors presenting the course, whereas emotional engagement is related to their interest in and feelings about the course. On the one hand, students display cognitive involvement.

The level of engagement was found to be high in nearly all items, it showed that students could be activated on their various activities during virtual learning. Furthermore, these data imply that the use of technology can affect student participation in online modes of instruction behavioral, cognitive, and emotional aspects. According to Redmond et al. (2018), the online student engagement framework advises that students engage in learning along five dimensions: cognitive, behavioral, social, collaborative, and emotional. The integration of neuroscience principles in online teaching can enhance student engagement and create a more engaging and brain-friendly learning experience.

Based on the figure 1 And 2 that Students both from Indonesia and Pakistan in online classrooms had a higher level of cognitive and behavioral engagement than emotional engagement, implying that students and lecturers should focus more on emotional engagement-related activities. The learning engagement on self-learning and responsibility for their learning by doing was found to be satisfactory. The neuroscience influence behavior, cognition, and emotion engagement (Riva, 2021; Rukminingsih et al., 2021 & Garcia-Monge, 2020).

Based on the table 6. summary of the comparison between Indonesia and Pakistan EFL students' behavioral engagement in online classroom showed that students' Pakistan percentage was higher than students' Indonesia percentage. Based on the figure 1. summary of Indonesia students' engagement showed that behavioral engagement was higher than cognitive and emotional engagement. Based on the figure 2. summary of Pakistan students'

engagement showed that cognitive engagement was the lower than behavioral, but it was higher than emotional engagement. In this study, it showed students' persistence, effort, and commitment to their own learning during a learning activity. As a result, this study is not different from the theories of behavioral engagement in online self-paced situations presented by Fredricks et al. (2016) & Dwivedi et al. (2019).

Based on the table 7. summary of the comparison between Indonesia and Pakistan EFL students' cognitive engagement in online classroom showed that students' Pakistan percentage was higher than students' Indonesia percentage. Based on the figure 1. summary of Indonesia students' engagement showed that cognitive engagement is the lower than behavioral, however, it is higher than emotional engagement. Based on the figure 2. summary of Pakistan students' engagement showed that cognitive engagement was the lower than behavioral, but it was higher than emotional engagement. It is in line with Chapman (2003), as mentioned in Kew & Tasir (2021), states

Based on the table 8. summary of the comparison between Indonesia and Pakistan EFL students' emotional engagement in online classroom showed that students' Pakistan percentage was higher than students' Indonesia percentage. Based on the figure 1. summary of Indonesia students' engagement showed that emotional engagement is the lowest than behavioral and cognitive engagement. Based on the figure 2. summary of Pakistan, students' engagement showed that emotional engagement is the lowest than behavioral and cognitive engagement. Emotional involvement in this study includes levels of enjoyment, boredom, and frustration taken from Fredricks et al. (2016) and Dwivedi et al. (2019). Lecturers encourage emotional involvement in their students by making them feel connected and encouraged in their online studies. It is in line with Krause and Coates (2018) suggested that by finding ways to interact with students and develop connections between students and their peers, teachers can aid increase student retention and help them fully engage in the online learning.

Previous research found varying levels of student participation in online learning. Some found strong levels of student involvement (Oraif & Elyas, 2021; Rojabi, 2020; Suharti et al., 2021), whereas others said online learning was ineffective.does not encourage student participation (Dumford & Miller, 2018; Mukhtar et al., 2020). Meanwhile, our data indicate that student participation in online learning is anywhere between high and low. Despite being low in certain places, student participation is great in others. According to Saputra et al. (2021), some students give good comments because they consider online learning as a fun activity, whilst others give negative reactions because they consider it as an uncomfortable activity.

Finally, the students both from Indonesian and Pakistan indicated that they received good grades and behaved well on the test, which is consistent with the findings of the (Bolliger & Halupa, 2018; Buelow et al., 2018) study on performance engagement. Technology and media intervention (Gil-Doménech & Berbegal-Mirabent, 2019), the use of new teaching techniques (Luo et al., 2017), and even the quality of teacher-student communication (Laksana & Tanduklangi, 2019) all lead to improved student performance in English online learning.

CONCLUSION

According to the research's findings, online learning in Indonesia and Pakistan shown to have positive levels of behavioral, cognitive and emotional engagement. The most positive engagement from both Indonesia and Pakistan students was behavioral engagement. Then, students' cognitive engagement was more positive than emotional engagement. Then the finding also showed that the students' engagement in Pakistan students was high positive level than Indonesia students. Students' emotional, behavioral and cognitive engagement in online

classroom based on neuroscience approach explores how students interact, learn, and feel in online learning environment and how their brain function and process information during online learning.

Based on the finding and discussion in this study, we would like to suggest to policymakers in education, higher education schools, and English EFL lectures to view students' engagement as a complex construct where behavioral, cognitive, and emotional engagement influence one another and students' learning. Therefore, it is advised that educators focus on developing a school climate that supports both in-person and online learning and that students' participation be seen as a major component that effects their learning and accomplishment In order to achieve the sustainable development goals through efficient educational methods in Indonesia, Pakistan and elsewhere, To encourage students' participation in meaningful learning with creativity, critical thinking, collaboration, and effective communication skills for the twenty-first century, further research is needed.

REFERENCES

Adnan, M, & Kainat, A. (2020). Online learning amid the COVID-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology* 2(1):45–51. https://doi.org.10.33902/JPSP.2020261309

Appleton, J. J., Christenson, S. L., Kim, D., & Reschly, A. L. (2006). Measuring cognitive and psychological engagement: Validation of the student engagement instrument. *Journal of School Psychology,* 44, 427-445.

Bolliger, D. U., & Martin, F. (2018). Instructor and student perceptions of online student engagement strategies. *Distance Education*, 39(4), 568–583.

Buelow, J. R., Barry, T., & Rich, L. E. (2018). Supporting learning engagement with online students. *Online Learning* Journal, 22(4), 313–340.

Crampton, A., Ragusa, A.T., & Cavanagh, H. (2012). Cross-discipline investigation of the relationship between academic performance and online resource access by distance education students. *Research in Learning Technology*, 7(5), 20-31 https://doi,org/10.3402/rlt.v20i0.14430

Casimiro, L. (2015). Engagement-for-Achievement: Creating a Model for Online Student Engagement. Paper presented at the EdMedia: World Conference on Educational Media and Technology 2015, Montreal,Quebec, Canada.

Casimiro, L. T. (2016). Cognitive engagement in online intercultural interactions: Beyond analytics. *International Journal of Information and Education Technology*, 6(6), 441-447.

Caine, R. N., & Caine, G. (1994). Making connections: Teaching and the human brain(2nd ed.). Menlo Park, CA: Addison-Wesley Publishing Company.

D'Errico, F., Paciello, M., Cerniglia, L.(2016). When emotions enhance students' engagement in e-learning processes. *J e-Learn Knowledge Soc*, 12(1), 12-24.

Dumford, A. D., & Miller, A. L. (2018). Online learning in higher education: exploring advantages and disadvantages for engagement. Journal of Computing in Higher Education, 30(3), 452–465

Dwivedi, A., Dwivedi, P., Bobek, S., & Sternad Zabukovšek, S. (2019). Factors 197 affecting students' engagement with online content in blended learning. Kybernetes, 48(7), 1500–1515. https://doi.org/10.1108/K-10-2018-0559

Fudan, J. (2021). Online teaching experience During the COVID-19 in Pakistan. Pedagogy–Technology Balance and Student Engagement. Online Teaching Experience, 7(2), 120-130.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: potential of the concept, stateof the evidence. *Review of Educational Research,* 74(1), 59-109. https://doi.org.10.3102/00346543074001059

Fredricks, J. A., Wang, M.-T., Schall Linn, J., Hofkens, T. L., Sung, H., Parr, A., & Allerton, J. (2016). Using qualitative methods to develop a survey measure of math and science engagement. *Learning and Instruction,*43, 5-15. https://doi.org.10.1016/j.learninstruc.2016.01.009

García A., Rodríguez, N. H., González, C., & Bores, G. (2020). Brain activity during different throwing games: eeg exploratory study. *International Journal of Environmental Research and Public Health,* vol. 1 (7), 1-18.

Gil-Doménech, D., & Berbegal-Mirabent, J. (2019). Stimulating students' engagement in mathematics courses in non-STEM academic programmes: A game-based learning. Innovations in Education and Teaching International, 56(1), 57–65.

Hospel, V., Galand, B., & Janosz, M. (2016). Multidimensionality of behavioural engagement: Empirical support and implications. *International Journal of Educational Research*, 77, 37-49.

Jensen, E. (2012). Brain-based learning: The new paradigm of teaching(2nd ed). Thousand Oaks, CA: Corwin Press.

Jensen, E. (2005). Teaching with the brain in mind (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development. Thousand Oaks, CA: Corwin Press.

Kew, S. N., & Tasir, Z. (2021). Analysing students' cognitive engagement in e-learning discussion forums through content analysis. Knowledge Management & E-Learning, 13(1), 39–57. https://doi.org/10.34105/j.kmel.2021.13.003

Luo, N., Zhang, M., & Qi, D. (2017). Effects of different interactions on students' sense of community in e-learning environment. *Computers & Education,* 115, 153–160.

Laksana, A., & Tanduklangi, A. (2019). The significance of teacher-students relationship and students' academic achievement. *Journal of Language Education and Educational Technology*, 1(12), 1–12.

Mukhtar, Khadijah, Kainat, Javed, Mahwish, Arooj, and Ahsan, Sethi. (2020). Advantages, limitations and recommendations for online learning during COVID-19 pandemic era. *Pakistan Journal of Medical Sciences*. 3(6), 27–31. https://doi.org/10.12669/pjms.36.COVID19-S4.2785

Mukhtar, K., Javed, K., Arooj, M., & Sethi, A. (2020). Advantages, limitations and recommendations for online learning during COVID-19 pandemic era. *Pakistan Journal of Medical Sciences*, 3(6), 12-24.

Monkaresi, H., Bosch, N., Calvo, R.A., D'Mello, S.K..(2016). Automated detection of engagement using video-based estimation of facial expressions and heart rate. *IEEE Trans. Afect. Comput*. 8(1), 15–28 (2016).

Oraif, I., & Elyas, T. (2021). The impact of COVID-19 on learning: Investigating EFL learners' engagement in online courses in Saudi Arabia. Education Sciences, 11(3), 99-119.

Pittaway, S., & Moss, T. (2014). Initially, we were just names on a computer screen: Designing engagement in online teacher education. Australian Journal of Teacher Education, 39(7), 37–45. https://doi.org/10.14221/ajte.2014v39n7.

Rojabi, A. R. (2020). Exploring EFL Students' Perception of Online Learning via Microsoft Teams: University Level in Indonesia. *English Language Teaching Educational Journal*, 3(2), 163–173.

Riva, G., Wiederhold, & Mantovani, F. (2021). Surviving COVID-19: The neuroscience of smart working and distance learning. *Cyberpsychology, Behavior, and Social Networking*, 24(2), 79-85.

Reyes-Fournier, Edward J. Cumella, Michelle March, Jennifer Pedersen, & Gabrielle Blackman.(2021). Development and validation of the purdue global online teaching effectiveness scale. *Online Learning*, 24(2) 2, 111–127.

Rukminingsih, A. G. & Latief, M.A. (2020). *Metode penelitian pendidikan*. Erhaka Utama.

Redmond, P. (2014). Reflection as an indicator of cognitive presence. *E-Learning and Digital Media*, 11(1), 46–58.

Reeve, J., & Tseng, C. M. (2011). Agency as a fourth aspect of students' engagement during learning activities. *Contemporary Educational Psychology,* 36(4), 257–267. https://doi.org.10.1016/j.cedpsych.2011.05.002.

Rukminingsih., Mujiyanto, J., Nurkamto, J., & Hartono, R. (2021). The impact of online instruction integrated with brain based teaching to EFL students with different motivation level. *Journal of e -Learning and Knowledge Society*, 17(1), 66-73. https://doi.org/10.20368/1971- 8829/1135339

Rukminingsih. (2018). Integrating neurodidactics stimulation into blended learning in accommodating students English learning in EFL setting. Paper presented at The Asian Conference on Education (ACE)- IAFOR.

Ruisoto, P. & Juanes, J.A. (2019). Fostering student's engagement and active learning in neuroscience education. *Journal of Medical System*, 4(3), 66-78.

Saputra, W. N. E., Wahyudi, A., Supriyanto, A., Muyana, S., Rohmadheny, P. S., Ariyanto, R. D., & Kurniawan, S. J. (2021). Student perceptions of online learning during the covid-19 pandemic in Indonesia: A study of phenomenology. *European Journal of Educational Research*, 1515–1528.

Suharti, D. S., Suherdi, D., & Setyarini, S. (2021). Exploring students' learning engagement in EFL online classroom. Thirteenth Conference on Applied Linguistics (CONAPLIN 2020), 139–149. Trowler, V.

Wang, M.-T., Fredricks, J. A., Ye, F., Hofkens, T. L., & Linn, J. S. (2016). The math and science engagement scales: Scale development, validation, and psychometric properties. *Learning and Instruction Journal*, 4(3), 16-26. https://doi.org/10.1016/j.learninstruc.2016.01.008

Wang, R., & BrckaLorenz, A. (2018). International student engagement: An exploration of student and faculty perceptions. Journal of International Students, 8(2), 1002–1033.

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). SAGE Publications Inc.

PORTRAIT OF INDONESIAN AND PAKISTAN EFL STUDENTS' ENGAGEMENT IN ONLINE CLASSROOM BASED ON NEUROSCIENCE APPROACH

8	**Submitted to University of the Pacific** Student Paper	1%
9	**www.researchgate.net** Internet Source	1%

Exclude quotes	On		Exclude matches	< 1%
Exclude bibliography	On			