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Student's learning experiences in an online learning environment using Garrison's CoI framework

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ABSTRACT

This study was conducted to examine the implementation of online learning in distance education utilizing the *Community of Inquiry* (CoI) framework, as introduced by Garrison. The CoI framework consists of three core elements essential in implementing online learning: social presence, cognitive presence, and teaching presence. These components are crucial for the success of online learning modalities. This is due to the nature of online learning, where instructors and learners are not present at the exact location or time, necessitating a 'binding element' in the educational process to ensure effective management of learning activities. Consequently, this research involved distributing questionnaires to 317 participants enrolled in online courses at Universitas Terbuka Indonesia. The results obtained from this study were classified as high, indicating that all three CoI elements achieved high ratings. Specifically, the aspect of cognitive presence was dominated by resolution capabilities. In social presence, the open communication capacity scored higher than the affective and cohesive components. Meanwhile, facilitating discourse was rated higher in the teaching presence domain than instructional design, organization, and direct instruction. Based on these findings, it can be concluded that learning across these three aspects is considerably high in the students' online learning experiences.

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ABSTRAK

Penelitian ini dilakukan untuk mengetahui bagaimana pembelajaran daring pada pembelajaran jarak jauh melalui pendekatan Community of Inquiry (CoI) framework yang diperkenalkan oleh Garrison. CoI memiliki tiga unsur yang menjadi perhatian dalam implementasi pembelajaran daring, yaitu social presence, cognitive presence, dan teaching presence. Ketiga unsur ini menjadi komponen penting dalam keberhasilan pembelajaran yang bersifat daring. Mengapa demikian? Karena pembelajaran daring adalah pembelajaran dimana antara pengajar dan peserta tidak berada pada tempat dan waktu yang bersamaan. Sehingga jika tidak ada "pengikat" dalam proses pembelajaran tersebut akan sulit untuk mengontrol pelaksanaan pembelajaran. Oleh karena itu, pada penelitian ini dilakukan penyebaran kuesioner kepada 317 peserta yang mengikuti perkuliahan pembelajaran daring di Universitas Terbuka Indonesia. Hasil yang diperoleh dari penelitian ini dalam kategori tinggi. Hal ini menunjukkan bahwa dari ketiga unsur CoI berada pada kategori tinggi, sspek cognitive presence didominasi oleh kemampuan resolution. Pada aspek social presence kemampuan open communication tinggi dibandingkan affective dan cohesive. Sedangkan pada aspek teaching presence facilitating discourse memiliki nilai lebih tinggi dibandingkan instructional design and organization dan direct instruction. Berdasarkan data tersebut dapat disimpulkan bahwa kehadiran pembelajaran dari ketiga aspek tersebut cukup tinggi dalam pembelajaran daring yang dialami oleh siswa.

Kata Kunci: *community of Inquiry; evaluasi pengalaman belajar mahasiswa; pembelajaran daring*

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INTRODUCTION

Technology development has significantly progressed, affecting all aspects of life, including education. In the world of education, which includes several elements, such as the learning process, there have been significant changes due to rapid technological advances. The learning process, generally only face-to-face in class, now has many virtual or online interactions. (Flynn-Wilson & Reynolds, 2021; Yusny *et al.*, 2021). Even though people's lives are still affected by the COVID-19 pandemic, the online learning process still occurs frequently because teachers are accustomed to and adaptive to the online learning process (Mooney *et al*., 2023).

Online learning is still ongoing in universities even though COVID-19 has been declared to have decreased. However, several obstacles in online learning continue to be challenges in its implementation. These obstacles include communication obstacles, technological obstacles, obstacles to the ambiguity of basic concepts, obstacles due to boring learning, and obstacles to the weak curriculum (Morrison-Smith & Ruiz, 2020). This condition could cause a decrease in student motivation and learning outcomes, so action is needed to manage online learning. In addition, online education at the children's level requires parental guidance to open learning platforms, understand learning materials, and do assignments (Reimers *et al.,* 2020). Sometimes, when guiding children to understand learning, parents complain because of the many changes in the world of education (Arini & Wiguna, 2021).

The online learning process certainly has both positive and negative impacts, one of which is on students. Research stating that online learning can improve student learning outcomes has been carried out, and that student learning outcomes during online learning are higher than when face-to-face in class (Nugraha *et al.*, 2020). However, based on previous research, it is known that online learning causes students' understanding to be low (Alfiaturrohmaniah *et al.*, 2022). This is reinforced by research which states that the impact of online learning is that it reduces students' motivation to learn, reduces students' discipline in doing assignments, and can have adverse effects on students (Hita *et al.,* 2021; Fadilla & Nurfadhilah, 2022). Research also concludes that students' cognitive abilities in applying learning materials still need to improve even though they use online learning designs (Nuraeni *et al.*, 2020).

Through online learning, learning experiences in an online environment are expected to emerge from students and lecturers. In the context of the Community of Inquiry (CoI), learning through an online learning environment is expected to provide students with high enthusiasm for learning. Learning must be designed to be more attractive, interactive, and enjoyable, preventing learning loss. Community of Inquiry (CoI) can be used to explore the aspects of student and lecturer social presence, cognitive presence, and teaching presence in the implementation of online learning in the ICE Institute MOOCs environment. The development of MOOCs is proliferating, as evidenced by the many universities that provide free access to courses that can be accessed by students outside the university and the general public (Suharso *et al.*, 2021).

The independent learning or independent campus policy initiated by the government has also motivated the community, including students, to take various courses provided by institutions such as the ICE Institute, which offers different classes that all people can take freely at home and abroad. Domestically, the Independent Campus policy is a government policy developed by the Minister of Education and Culture to encourage the community and students to master various sciences prepared to enter the world of work. The Independent Campus policy allows students to freely choose the courses they will take, which is expected to improve the competence of university graduates (Simatupang & Yuhertiana, 2021).

International, Currently the number of students taking courses at the ICE Institute is approximately 3,700 students, and 220 students have graduated from several Edx courses (https://www.ut.ac.id/berita/2021/10/ice-institute-untuk-indonesia-satu). Although it has not been

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established for long, there are quite a lot of students and lecturers who take lectures at ICE. However, little data shows how the learning process and learning experience occur when students and lecturers become ICE participants. Therefore, this study will investigate how students and lecturers think about their learning and teaching experiences while taking courses at ICE. In analyzing how students think, the Community of Inquiry (CoI) theory will be used to explore students' and lecturers' opinions about their learning and teaching experiences in online learning.

LITERATURE REVIEW

Community of Inquiry

Community of Inquiry (CoI) is one inquiry learning design that involves forming groups or learning communities. Community of Inquiry (CoI) is a collaborative inquiry that involves students in independent learning groups with teacher support (Kusuma *et al.*, 2020). In this learning design, students are directed to form a dynamic community in which they are responsible for constructing meaning and confirming understanding through active participation, contributing, and collaborating in the inquiry process. The Community of Inquiry (CoI) learning design focuses on students' online learning experiences from the satisfaction of text-based, asynchronous, and online learning (Purwandari *et al.*, 2022). Community of Inquiry (CoI) learning is conceptualized in students' teaching, social, and cognitive abilities to achieve meaningful education through inquiry learning.

Community of Inquiry (CoI) is a learning group that cooperatively conducts critical discussions and reflections to develop meaning and confirm understanding as a form of reciprocity. In Community of Inquiry (CoI) learning, students' cognitive abilities are more significant than their social and teaching abilities, resulting in positive learning outcomes (Yıldırım & Seferoglu, 2021). However, the three elements are interrelated and have the same role in developing the quality of learning, although cognitive abilities are more dominant in the inquiry learning process. Social and teaching abilities of students as components that accelerate the learning process. Meanwhile, cognitive abilities are students' abilities to develop their knowledge through communication (Purwandari *et al.*, 2022). It can be seen in **Image 1** that these three elements are interrelated and form a profound learning experience, as follows.

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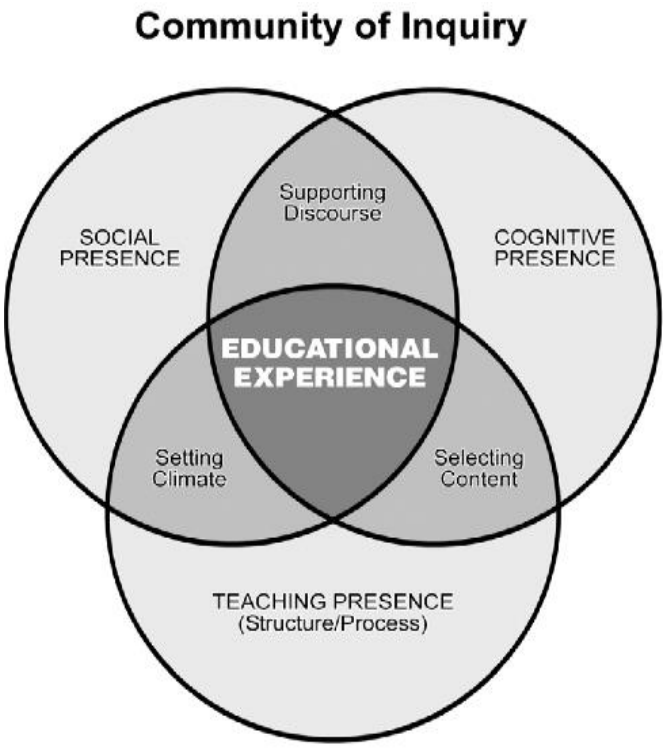

Image 1. *Community of Inquiry* Concept
Source: Garrison & Arbaugh (2007)

Furthermore, three concepts of participation in developing a Community of Inquiry (CoI) (**Image 1**) are cognitive participation, social participation, and teaching participation. Cognitive participation is the ability of students to build and confirm understanding through inquiry learning (Garrison & Arbaugh, 2007). Social participation is the ability of students to describe their personality to communicate and develop relationships with the community. Meanwhile, teaching participation is the design, organization, facilities, and direction of social and cognitive processes to achieve maximum learning outcomes (Kusuma, 2020). **Table 1** shows the categories and indicators of the three elements of the Community of Inquiry (CoI) as follows:

Table 1. Element, Category, and Indicators for *Community of Inquiry (CoI)*

Element	Category	Indicator
Cognitive Presence	*Triggering Event*	*Sense of Puzzlement*
	Exploration	*Information Exchange*
	Integration	*Connecting Ideas*
	Resolution	*Apply New Ideas*
Social Presence	*Effective Expression*	*Emoticons*
	Open Communication	*Risk-free Expression*
	Group Cohesion	*Encourage collaboration*
Teaching Presence	*Design & Organization Setting*	*Curriculum & Methods*
	Facilitating	*Discourse Sharing Personal Meaning*
	Direct	*Instruction Focusing Discussion*

Source: Garrison & Arbaugh (2007)

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In addition, Community of Inquiry (CoI) can support students to build relationships with others to collaborate, communicate, and participate socially, thus providing a fun online learning experience (Ng, 2022). Using the Community of Inquiry (CoI) learning design, online learning can improve students' abilities and knowledge with teacher support so that learning outcomes show positive results (Yıldırım & Seferoglu, 2021). The presence of a Community of Inquiry (CoI) is essential to shape students' online learning experiences with open communication that can reduce differences between students and teachers, improve academic abilities, and actively contribute to learning activities (Banayo & Barleta, 2022; Grothaus, 2022; Purwandari *et al.*, 2022).

Online Learning

Online learning is a learning activity that uses the internet network to interact (delivery method) and facilitate learning services (Fadilah, 2021). It is an activity encouraged and supported by technology (Anugrahana, 2020). Furthermore, online learning can be done remotely via communication devices and the Internet (Fadilah, 2021). Online learning utilizes the Internet network, thus allowing students the freedom to learn anywhere and anytime (Anggianita *et al.*, 2020).

Online learning in Indonesia began to develop in 2020 when the COVID-19 pandemic limited the movement of students and lecturers. Hence, learning activities shifted to the digital world, which did not require students to come to campus. Online learning can make students and lecturers interact directly through several platforms connected to the internet (Anggianita *et al.*, 2020). Banyak platform digital yang dapat dimanfaatkan untuk pembelajaran daring, seperti Google Classroom, Google Meet, Zoom, Youtube (Dewi, 2020). Social media, learning management systems (LMS), and learning websites can be used as online learning media (Anim, 2020).

Online learning is an educational innovation that uses technological devices and internet networks to deliver learning materials. Online learning resources can combine several learning resources, such as documents, videos, images, and audio, making it easier for students to see, read, hear, and understand learning materials. These learning resources are the determinants of learning success, so they must be packaged as attractively as possible and according to student character to achieve learning objectives (Anggianita *et al.*, 2020).

Online learning is website-based learning that provides training and learning materials through electronic devices integrated with the Internet. Online learning includes principles that support the impact of online learning, as follows (Sari *et al.*, 2024):

1. Multimedia consisting of electronic devices and internet networks.
2. Information storage that provides various types of information according to student needs that can be accessed at any time.
3. Collaborative platforms that support student communication during the learning process.
4. Internet networks that support the learning process so that students can follow the learning well.
5. Allows students to access learning materials from other platforms, not only from the online learning platform.
6. Good operational management so that online learning can improve student learning outcomes.

Online learning includes many benefits that students and teachers can feel; these benefits are as follows (Fadilah, 2021):

1. Can build communication and discussion between students and lecturers and students with other students.
2. Can facilitate communication between students, lecturers, and parents.
3. Can be used as a medium for conducting exams and quizzes.

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4. Can provide convenience in delivering image or video material to students.
5. Can facilitate students in obtaining learning materials.
6. Can facilitate lecturers in creating exam or quiz questions anywhere and anytime.

In addition to the various benefits, online learning is not free from shortcomings that become obstacles in its implementation. The shortcomings of online learning include the following (Hasyim & Hayati, 2023):

1. Lack of interaction between students and lecturers during the learning process.
2. Online learning platforms (Google et al.) are not used optimally; they are only used when the lecturer is absent, giving assignments or exams.
3. An unstable internet network is a significant obstacle to online learning.
4. study time misuses often occur when online learning students open other applications.
5. Lack of discussion in online learning via Zoom or class groups (WhatsApp).
6. Some students still need technological devices supporting online learning platforms.

ICE Institute

ICE Institute is Indonesia Cyber Education, an online lecture center developed by the Ministry of Education and Culture. ICE has provided various online lectures from multiple universities and online learning providers throughout Indonesia. The ICE Institute aims to facilitate quality education and simultaneously guarantee the quality of online learning services and distance education. Students can use ICE to carry out independent learning activities and simultaneously help develop the careers of participants (https://icei.ac.id/tracks/about/). Currently, one can take various courses at the college level by selecting and registering as a participant at the ICE Institute. ICE Institute is a marketplace for online classes in Indonesia, and it currently has 1381 courses from EdX and 165 courses from the ICE Institute consortium. The ICE Institute consortium consists of 14 higher education institutions in Indonesia and international educational institutions. Currently, the number of students taking courses at the ICE Institute is approximately 3,700, and 220 students have graduated from several Edx courses.

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METHODS

This research was conducted by distributing questionnaires via Google Forms, which were delivered to students who had participated in online learning. The instrument developed comprised 22 questions about the Community of Inquiry (CoI) concept. Community of Inquiry (CoI) consists of social presence, cognitive presence, and teaching presence (Garrison & Arbaugh, 2007). The questionnaire was distributed using a Likert scale of 1-4. The instrument was tested for validity and reliability before being distributed.

Validity test using Pearson Bivariate Correlation analysis technique. The r-table value with 309 degrees of freedom of 0.11 was obtained based on the validation test results. The results of the analysis in Table xx show that the correlation value for each item with the total construct or r-count is greater than the r-table value, so it can be concluded that each item has been valid based on Pearson Bivariate Correlation or that each item supports its construct well.

Sedangkan uji reliabilitas pada instrumen ini mengacu pada teori Composite Reliability dengan rumus:

$$\rho c = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + \sum_i \text{var}(\varepsilon_i)}$$

Where $var\ (\epsilon_i)$Is the variance of the measurement error of the item. It is known that the square of the total weight of the factors is shown in Table 2**.**

Table 2. Kuadrat Total Bobot Faktor dari masing-masing Konstruk

Construct	Kuadrat Total Bobot Faktor
Cognitive	218,95
Social	103,69
Teaching	224,4

Sumber: Dokumentasi Penulis 2023

RESULTS AND DISCUSSION

Based on the data obtained from the results of data collection. Then received several 311 students who filled out the questionnaire, with the following data distribution (Table 3):

Table 3. Data responded

Aspects	Variable	Total (N)	Percentage (%)
Gender	Male	58	18,65
	Female	253	81,35
Subject Area of Study	Science and Technology	23	7,2
	Social and Humanities	90	28,48
	Education	142	44,94
	Research Methods	39	12,34
	Other	22	6,9

Sumber: Hasil Penelitian 2023

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The demographic data of the participants in this study shows a significant female majority, with 81.35% female participants compared to 18.65% male. Academically, the distribution shows a strong tendency towards the fields of Education (44.94%), Social Sciences and Humanities (28.48%), followed by Research Methods (12.34%), Science and Technology (7.2%), and other fields (6.9%). This profile highlights women's dominant involvement in educational technology and those working in disciplines that focus on education. As experts in the field of educational technology, this insight underscores the need to tailor technology integration and curriculum development to meet the interests and needs of this critical demographic group, thereby optimizing the effectiveness and inclusiveness of education.

Measuring Cognitive, Social, and Teaching Aspects from a Student Perspective

The Cognitive, Social, and Teaching measurement activities refer to the scores generated by students from the choices of strongly agree = 4, agree = 3, disagree = 2, and strongly disagree = 1. For each indicator of each construct, the total score is calculated, then the average is calculated and categorized based on **Table 4**.

Table 4. Kategori berdasarkan Rerata Skor

Average (*p*)	Category
1 - 1,5	Very Low
1,51 - 2,5	Low
2,51 - 3,5	High
3,51 - 4	Very High

Sumber: Hasil Penelitian 2023

We obtain the percentage of students in each category for cognitive constructs from these categories, as shown in **Table 5**.

Table 5. Percentage of Students for Each Category in Cognitive Constructs

Indicator	Very High	High	Low	Very Low
Triggering Event	23,79 %	74,6 %	1,61 %	-
Exploration	27,97%	71,06%	0,96%	-
Integration	25,08 %	73,31 %	1,61 %	-
Resolution	20,58 %	78,78 %	0,64 %	-

Sumber: Hasil Penelitian 2023

The Community of Inquiry (CoI) model depicts four progressive stages of collaborative learning: Trigger Event, Exploration, Integration, and Resolution, as evidenced by graphical representations depicting student engagement at each phase. Specifically, the Trigger Event (23.79%) serves as the starting point, triggering an inquiry by introducing a problem or question. Subsequently, the Exploration phase (27.97%) shows a slightly higher percentage of students engaged in researching and discussing the topic, indicating progress from the initial trigger. Similarly, the Integration phase (25.08%) highlights students' efforts in synthesizing information and formulating solutions, with a comparable percentage of students engaged. However, the Resolution phase (20.58%) shows the lowest level of student engagement, indicating challenges in applying acquired knowledge and reaching conclusions. Although some students showed progress, others appeared to lag, indicating heterogeneous progress. Strategies such as reviewing the

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Trigger Event for clarity and engagement, providing scaffolding during Exploration and Integration, and fostering collaboration among students are recommended to increase engagement and ensure successful completion of Community of Inquiry (CoI) projects.

Table 6. Percentage of Students for Each Category in Social Constructs

Social Presence	Very High	High	Low	Very Low
Affective	19,61 %	76,52 %	3,86 %	-
Open Communication	18 %	80,38 %	1,61 %	-
Cohesive	18,97 %	78,13 %	2,89 %	-

Sumber: Hasil Penelitian 2023

Based on Table 6, the Social Presence Element in online education has three categories: Affective, Open Communication, and Coercive. Each category shows a value that falls into the "High" category. The Affective category (76.52%) illustrates that most students can express many emotions during online learning. In addition, the Open Communication category (80.38%) demonstrates that students feel that during the learning process, there is good communication between teachers and students or students and feel safe and encouraged to express themselves openly. However, there are still doubts in specific contexts or subjects. Finally, the cohesive category (78.13%) shows a strong group dynamic that encourages cooperation. This relationship indicates that most students feel a positive social presence, essential for a practical online learning experience. For more details, here is **Table 6**.

The percentage of students in each category for social construction is shown in **Table 7**.

Table 7. Teaching Presence

Teaching Presence	Very High	High	Low	Very Low
Instructional Design and Organization	23,15 %	74,6 %	2,25 %	-
Facilitating Discourse	18,32 %	79,42 %	2,25 %	-
Direct Instruction	19,61 %	77,49 %	2,89 %	-

Sumber: Hasil Penelitian 2023

Based on **Table 7**, the Teaching Presence Element in online education has three categories: Instructional Design and Organization, Facilitating Discourse, and Direct Instruction. Each category shows a value that falls into the "High" category. The instructional design and organization category results show that the learning methods have implemented the online learning provided. In addition, the Facilitating Discourse category shows that online learning offers facilities for students to be actively involved in discussions and share insights effectively. Finally, the Direct Instruction category shows that the online teaching methods effectively focus discussions and help students understand key concepts from the material presented.

Discussion

Online learning is ongoing today, and various programs have been developed to support this learning. Previous research has found that online learning can help improve abilities that lead to the creative process and increase learning motivation (Muzaini *et al*., 2021). Online learning is divided into two types: asynchronous and synchronous (Rehman & Fatima, 2021). In online learning at ICEI, the nature is asynchronous, designed for independent learning, because through the prepared LMS, students can

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access materials and assignments asynchronously according to their respective learning times (self-paced). However, various supports are needed for the smooth running of the learning process.

Proper online education requires digital tools and resources to support asynchronous learning. Through e-learning, students can learn anytime and anywhere without being limited by space and time (Careaga-Butter *et al*., 2020). Various activities can be done, such as online discussions, assignments, downloading materials, uploading materials, learning videos, sending messages, etc. However, developing e-learning-based learning models must be carefully designed according to the desired objectives. Previous studies found that student acceptance of asynchronous learning was influenced by the characteristics of educators, organizational and technical support, technological innovation, and student trust in online learning organized by institutions (Persada *et al*., 2022).

Efforts to see the effectiveness of online learning can be made by applying the Community of Inquiry (CoI) theory. This theory consists of three essential elements, namely teaching presence, cognitive presence, and social presence (Garrison & Arbaugh, 2007). The inquiry learning model is one of the learning models that can measure the relationship between student understanding (cognitive presence), teaching presence, and the social relationship between students (social presence) and their lecturers in learning. The Community of Inquiry (CoI) framework is general because it is conceptually based on the theory of teaching and learning in higher education. Philosophically, the Community of Inquiry (CoI) framework is consistent with John Dewey's work on always being curious or asking questions (inquiry).

According to the Community of Inquiry (CoI) theory, learning will be successful if it has three main elements. The learning experience in college is different from the learning experience in high school. (Garrison & Arbaugh, 2007). In college, students must be able to become the main subject who can regulate their own desired learning process. The task of lecturers as teachers in college is always to provide motivation, invite students to work together, and actively participate in the learning process provided by lecturers.

CONCLUSION

Based on the study's results, it can be concluded that cognitive, social, and teaching are present in online learning. The acquisition of cognitive learning experiences can be seen from triggering events through giving assignments to improve student learning activities. Furthermore, exploration, integration, and resolution activities are carried out. In social activities, it will be seen in mutual respect, openness of communication, and being united in learning. In terms of teaching, it will be seen if learning is designed and organized systematically, provides facilities for learning, and direct learning also occurs, even though it is online.

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AUTHOR'S NOTE

Please write a statement that there is no conflict of interest regarding the publication of this article. The author also confirms that the article is free from plagiarism.

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