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The development of a plagiarism instructional package to enhance undergraduate students' plagiarism knowledge, awareness, and behavior

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Abstract

This research aimed to (1) develop an instructional package for teaching research plagiarism ethics to undergraduate students; and (2) investigate the effects of the instructional package on undergraduate students' plagiarism knowledge, awareness, and behavior. The research methodology was quasi-experimental research using the two-group pretest-posttest design, where the experimental group received the pretest, the instructional package, and the posttest. In contrast, the control group was administered both the pretest and posttest without exposure to the instructional package. Participants were 62 undergraduate students from the Research for Learning and Teaching Development (RLTD) course. Research instruments included a knowledge four-option multiple-choice test, an awareness five-point Likert scale, and a three-point analytical rubric behavioral checklist with five dimensions. Data were analyzed using ANOVA and ANCOVA—the instructional package comprised learning objectives, teaching, teaching materials, and an assessment. After receiving the instructional package, experimental-group students' plagiarism knowledge and awareness increased at a statistical significance of .05. Moreover, the experimental group gained more significant knowledge than the control group at a statistical significance of .05. However, no significant difference in awareness was found between the two groups. Students receiving feedback on research proposals showed more significant ethical research behavior than those receiving no feedback.

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Introduction

Research is an essential tool for increasing knowledge in all academic disciplines. It can be incorporated into classroom instruction as research-based learning with a view to enhancing students' autonomous and lifelong learning (Brew, 2006; Brew & Saunders, 2020; Healey & Jenkins, 2006; Pitiyanuwat & Bunterm, 1994; Srikoon et al., 2014; Yurdakul, 2017). As such, undergraduate programs now aim to equip students with research knowledge and skills necessary to further study at a graduate level and work professionally in their prospective careers.

With this in mind, the Faculty of Education, Chulalongkorn University (2009) provides the Research for Learning and Teaching Development (RLTD) course as part of all undergraduate curricula. All third-year students are required to pass the course prior to becoming pre-service teachers in real schools. One significant topic in the course deals particularly with research ethics. Nevertheless, teachers often find that in the course, many students plagiarize research proposals and reports from online sources. This problem is persistent over the course.

Recent study also confirms this problem with findings indicating that the rate and possibility of plagiarism in published academic journals are increasing as it is now much easier for plagiarists to have access to online electronic databases and articles, such as websites, search engines, social media, and multimedia tools (Al-Hashmi et al., 2023; Errami & Garner, 2008; Hafner, 2001; Jones, 2011; Kampa et al., 2024; Nabee et al., 2020; Owen, 2001; Ryan, 2007; Wilson, 2001). Moreover, the current state of academic integrity faces more challenges due to advanced artificial intelligence (AI) tools, such as copying original work and immediately pasting on paraphrasing AI tools to avoid detection (Cotton et al., 2023; Khalil & Er, 2023; Lannoy, 2023; Xiao et al., 2022). Based on my experience, many students often plagiarize prior work in the literature review in different ways. For instance, some revise certain contents by changing date information, some do not cite original sources or provide references, and others do not write correct citations and references. These practices are considered as unethical practices. A follow-up interview with students also indicated that students received electronic files from their senior students, making it easier for them to commit plagiarism.

Previous studies about plagiarism have also found that university students lack an understanding of plagiarism and show different perceptions and practices toward plagiarism. These issues result in students not being aware of their academic dishonesty and conducting plagiarism in both unintended and intended ways (Al-Hashmi et al., 2023; Fish & Hura, 2013; Kampa et al., 2024; Nabee et al., 2020; Park et al., 2013; Power, 2009; Roig & Caso, 2005; Srisongkram, 2011; Starovoytova & Namango, 2016; Upadhyay et al., 2023). Students must avoid this unethical behavior in their studies and future careers, for it is regarded as unethical in society and the workplace (Rohmad & Wahyuni, 2018; Upadhyay et al., 2023). One way to increase awareness of plagiarism and promote proper practices in academic writing is to teach the correct concept and point out the effect of plagiarism to students (Al-Hashmi et al., 2023; Anney & Mosha, 2015; Fish & Hura, 2013; Powell & Singh, 2016; Power, 2009; Rohmad & Wahyuni, 2018).

In light of this problem of plagiarism, as one of the teachers in the course, I intended to develop an instructional package on research ethics with an emphasis on plagiarism for literature reviews for undergraduate pre-service students in the Faculty of Education, Chulalongkorn University (2009). The instructional package was designed in particular to promote students' knowledge, behavior, and awareness regarding plagiarism in literature reviews and thereby prevent them from committing plagiarism and unethical behavior. As displayed in Figure 1, the present study was set out to investigate the effect of the instructional package on students' plagiarism knowledge, behavior, and awareness, and to investigate plagiarism behavior of undergraduate students enrolled in the RLTD course.

The current instructional package was developed based on four main principles: (1) learning material development, (2) multimedia-assisted learning, (3) research-based learning, and (4) assessment for learning. Multimedia tools developed in this study consisted of a research report, VDO clips, a movie, and worksheets containing content on academic cheating behaviors and plagiarism issues, which suit students' characteristics.

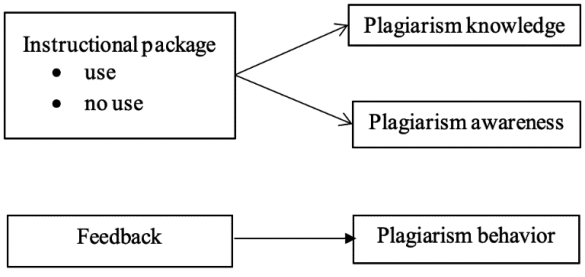

Figure 1 Research conceptual framework

The learning package in this study was a part of the research-based learning. It involved the development of a research proposal and assessment for learning and includes teacher feedback, self-assessment, peer assessment, teacher assessment, students' reflective learning report, and a plagiarism knowledge pretest and posttest.

All of the formative assessments will help students become more engaged in their learning (Earl, 2003). This study aims to prepare pre-service teachers with the necessary research knowledge and skills, as well as awareness of research ethics through research-based classroom learning. It is thus hoped that this study could serve as a preliminary tool for inculcating into students a sense of research ethics so that they will not commit plagiarism either intentionally or unintentionally. To this end, this research is aimed to (1) develop an instructional package for teaching research plagiarism ethics to undergraduate students in the Faculty of Education, Chulalongkorn University (2009); and (2) investigate the effects of the instructional package on undergraduate students' plagiarism knowledge, awareness, and behavior.

Research Hypotheses

1. Students who received instruction through the Research Ethics Package on Plagiarism for Undergraduate Students in the Faculty of Education, Chulalongkorn University (2009) based on the concept of using diverse learning media, have higher knowledge and awareness of research ethics related to plagiarism after learning compared to before learning.

2. Students who received instruction through the Research Ethics Package on Plagiarism, based on the concept of using diverse learning media, have higher knowledge and awareness of research ethics related to plagiarism than students who did not receive instruction through the Research Ethics Package on Plagiarism.

3. When controlling for the pre-learning knowledge and awareness of research ethics related to plagiarism, those who received instruction through the Research Ethics Package on Plagiarism have higher knowledge and awareness of research ethics related to plagiarism than those who did not receive instruction through the Research Ethics Package on Plagiarism.

4. Students who received feedback on suggestions for revising their research proposals based on the research-based learning approach and assessment for learning development have higher behaviors related to research ethics in plagiarism than students who did not receive feedback on suggestions for revising their research proposals.

Methodology

Participants

In this classroom action research study, 62 undergraduate students from two sections of the RLTD course were purposively selected. One section consisted of 32 students, and the other included 30 students. The researcher was responsible for teaching these sections. To investigate plagiarism knowledge and awareness, students were administered the pretest prior to the instruction and the posttest after the instruction. As shown in Figure 2, the current quasi-experimental research followed the two-group pretest-posttest design, where the experimental group received the pretest, the instructional package, and the posttes, and the controlled group were administered both the pretest and posttest without exposure to the instructional package.

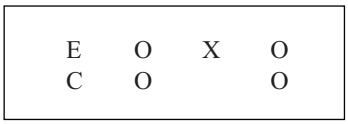

Figure 2 Experimental design

To examine plagiarism behavior, students were divided into four groups. The first group did not receive feedback but received the criteria for plagiarism behavior investigation. The second group received both feedback and the criteria for plagiarism behavior investigation. The third group did not obtain either feedback or the criteria for plagiarism behavior investigation. The fourth group received feedback but did not receive the criteria for plagiarism behavior investigation.

Intervention

The learning activities in the research for learning and teaching development course (RLTD) were designed throughout the semester. Table 1 provides additional details of learning activities and research tools within each period.

In April 2016, students learned to focus on the instruction through the research ethics package on plagiarism. Instruction through the research ethics package on plagiarism for undergraduate students in the Faculty of Education at Chulalongkorn University consisted of (1) learning outcomes, (2) learning management, (3) learning media, and (4) learning assessment.

Table 1 The Research for Learning and Teaching Development (RLTD) activities.

Period	Learning activity	Research tools
January 2016	- Testing knowledge and awareness of research ethics - Assigning students' task about reading research, writing research proposals, and doing research reports, along with setting deadlines for submitting each piece of work in the semester.	- Plagiarism knowledge test - Plagiarism awareness scale - Course syllabus
January - February 2016	Learning how to read and summarize research especially research topic on ethical research	- Summary research form
February 2016	Learning how to write a research proposal.	- The research proposal evaluation form with assessors including students and teacher
January -March 2016	Submitting the first draft of the research proposal by February 29, so that students would receive feedback for improving the work and submit their best work by March 31, 2016.	- Scoring rubric for research proposal assessment and - Research proposal evaluation form with assessors including students and teacher - Checklist for research ethic behavior (plagiarism) with assessors consisting of students and teacher
March -April 2016	Doing group research project and writing work research report on research ethics.	- A research report format with evaluators including students, peers, and teachers. - A checklist for verifying compliance with research writing principles (behavior of plagiarism in literature).
April 2016	Learning and discussion in experience on Instruction through the Research Ethics Package on Plagiarism	- PowerPoint and exercises related to research ethics on plagiarism - Reflection questions on research ethics
April 2016	Watch the film about the ethics of news writing by journalists, "Shattered Glass,"	- Learning activity task regarding the ethics of research writing
April 2016	- Testing on plagiarism knowledge test and plagiarism awareness scale	- Plagiarism knowledge test - Plagiarism awareness scale
April 2016	Listening to a lecture on how to write academic work without infringing copyright and avoiding plagiarism by Associate Professor. Manit Jumpha, Faculty of Law, Chulalongkorn University	- PowerPoint how to write academic work without infringing copyright and avoiding plagiarism

1. There were four learning outcomes after learning the Plagiarism Instructional Package. Students can (1.1) explain general knowledge and understanding of plagiarism, (1.2) identify actions that constitute plagiarism, (1.3) identify how to cite ideas or texts taken from the work of others, and (1.4) distinguish between plagiarized writing and non-plagiarized writing.

2. The learning management has three stages: introduction, learning process, and conclusion. In the introduction stage, students will discuss news about avoiding ethical issues in current situations, such as copying ideas, documents, or academic papers. In the learning process stage, students learn about the definition of plagiarism, types of plagiarism, plagiarism detector program, how to avoid plagiarism, how to write a paper properly and how to cite ideas and texts taken from others' work, the impact of research or academic plagiarism and example written work of plagiarism and non-plagiarism, and copyright and copyright infringement. Later, in the conclusion stage, students saw the video clip and discussion about ethical issues that they had learned. Before finishing the class, students received references and academic resources to study further. Moreover, they reflected on what they had learned.

3. The learning media used in the class consisted of news, songs, video clips from television programs, YouTube, PowerPoint, practice tasks, and computer, LCD, and Visualizer.

4. The learning assessment used discussion, task, plagiarism knowledge test, and plagiarism awareness scale.

Data Collection

Research instruments included ten items of a four-option multiple choice test of plagiarism knowledge with an alpha coefficient of .56, a five-point Likert scale of plagiarism awareness scale with an alpha coefficient of .72, a three-point analytical rubric checklist of plagiarism behavior with five dimensions, which was rated by the students, their peers, and the teacher. There was one section provided for suggestions and comments in the checklist. The inter-rater reliability among students, peers, and teachers was .77.

Data Analysis

Data were analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation), Analysis of variance (ANOVA), and Analysis of covariance (ANCOVA)

Results

The instructional package was developed based on multimedia learning materials, research-based learning, and assessment for learning. The instructional package comprised four major components: (1) learning objectives, (2) a three-stage learning process, (3) learning materials, and (4) assessment and evaluation. Details of each component of the instructional package or the intervention are as follows.

Learning objectives include (1) identifying knowledge about plagiarism, (2) classifying plagiarism behavior, (3) identifying references in the text, and (4) classifying papers with or without plagiarism. Lesson plans consist of an introduction, instructional procedures, and a conclusion. The introduction introduces students to research ethics from other career news or hot issues, which are presented through songs, pictures, articles, and plagiarized research reports. The instructional process aims to stimulate students' attention. It involves content regarding the definition of plagiarism, types of plagiarism, plagiarism detection programs, plagiarism prevention, research paper writing without plagiarism, and the impact of plagiarism.

While learning, they receive questions and quick formative assessments during the lessons, asking them to classify written texts with and without plagiarism. Apart from the plagiarism content, students learn how to notice documents with and without copyright and how to inviolate copyright. Finally, the conclusion involves video-clip watching concerning how to avoid academic dishonesty, discussion of what students learn, and students' written reflections on the lesson. Teaching materials include news, articles, songs, and video clips, and the assessment process involves testing, questioning, practicing, and reflecting.

Table 2 shows plagiarism knowledge and awareness analysis results between the experimental and control groups. With the multiple comparison methods, the value of p for statistical significance, conventionally, .05, is divided by the number of statistical tests performed. So, in the pretest and posttest, p for statistical significance is set at .05 divided by 2, equal to .025, preventing a type I error rate from multiple ANOVA. Regarding the implementation of the instructional package, results showed that the experimental group demonstrated a statistically significant increase in plagiarism knowledge (tExp= 1.50, p = .000), whereas the controlled group's post-test scores on plagiarism knowledge were not significantly higher than the pretest scores (tCont = 1.95, p = .067). Both experimental and controlled groups showed a significant increase in plagiarism awareness at statistically significant levels (tExp= 3.85, p = .001, tCont = 3.01, p = .005).

When comparing plagiarism knowledge and awareness between experimental and control groups, it was found that there were no significant differences in plagiarism knowledge and awareness between the two groups at the beginning. After implementing the instructional package, however, the experimental group's plagiarism knowledge was significantly higher than that of the control group at a statistically significant level (FExp= 5.978, p = .018). Still, no significant difference was found regarding plagiarism awareness between the two groups (FCont = .310, p = .580).

Table 2 Plagiarism knowledge and awareness between the experimental group and control group.

Time	Group	*M*	*SD*	Source	*SS*	*MS*	*F*	*p*
				Knowledge of plagiarism				
Pretest	Experimental Group	3.563	1.544	Between Group	0.054	0.054	0.025	.876
	Control Group	3.500	1.383	Within Group	117.875	2.183		
	Total	3.536	1.464	Total	117.929			
Posttest	Experimental Group	5.615	1.576	Between Group	17.933	17.933	5.978*	.018
	Control Group	4.417	1.886	Within Group	143.987	3.000		
	Total	5.040	1.818	Total	161.920			
				Awareness of plagiarism				
Pretest	Experimental Group	3.957	0.444	Between Group	0.248	0.248	1.394	.243
	Control Group	4.089	0.396	Within Group	9.800	0.178		
	Total	4.019	0.424	Total	10.049			
Posttest	Experimental Group	4.415	0.445	Between Group	0.070	0.070	0.310	.580
	Control Group	4.488	0.502	Within Group	11.200	0.224		
	Total	4.450	0.470	Total	11.270			

Note: * $p < .05$.

Regarding the controlled group, results from ANCOVA in Table 3 and ANOVA in Table 2 showed similar outcomes regarding plagiarism knowledge and awareness. The experimental group demonstrated a significant gain of plagiarism knowledge at statistically significant ($p < .05$), with a moderate effect size (eta2 = 0.122, Cohen's f = 0.373). However, no significant difference was found with plagiarism awareness between the two groups with moderate effect size (eta2 = 0.007, Cohen's f = 0.084) (Cunningham & McCrum-Gardner, 2007).

Figure 3 shows the relationship between plagiarism behavior and types of feedback from the four groups of students: Received both feedback and criteria of plagiarism behavior checklist (FBCR), Received feedback (FB), Received criteria of plagiarism behavior checklist (CR), and Not received both feedback and criterion of plagiarism behavior checklist (CON). Students receiving feedback on research proposal writing showed higher scores on research proposal writing or less plagiarism behavior than those receiving no feedback at the p level of .01. There were three assessment methods used, including self, peer, and teacher assessment (Fself = 4.91, p = .005; Fpeer =4.41, p = .008; Fteacher = 8.82, p = .008). A high correlation coefficient existed between Self and teacher assessment (r = .81, p = .001). The relationship between peer and teacher assessment was moderate (r = .58, p = .001), and the relationship between self and peer assessment was very low (r =.29, p = .052).

Table 3 Plagiarism knowledge and awareness between the experimental group and control group when controlled by pre-test on plagiarism knowledge and awareness score

Sources of variance of plagiarism knowledge	Type III SS	MS	*F*	*p*
Corrected Model	49.863	24.932	9.872*	.000
Intercept	61.892	61.892	24.508*	.000
Plagiarism Instructional Package	15.123	15.123	5.988*	.019
Plagiarism knowledge pre-test score	34.510	34.510	13.665*	.001
Error	108.593	2.525		
Total	1359.000			
Corrected Total	158.157			
Effect size of plagiarism knowledge eta^2 = 0.122, Cohen's f = 0.373				
Sources of variance of plagiarism awareness	Type III SS	MS	*F*	*p*
Corrected Model	2.088	1.044	1.877	.165
Intercept	5.244	5.244	9.426*	.004
Plagiarism Instructional Package	1.117	1.117	2.007	.164
Plagiarism awareness pre-test scale score	1.223	1.223	2.198	.145
Error	23.921			
Total	998.450			
Corrected Total	26.010			
Effect size of plagiarism awareness eta^2 = 0.007, Cohen's f = 0.084				

Note: * $p < .05$.

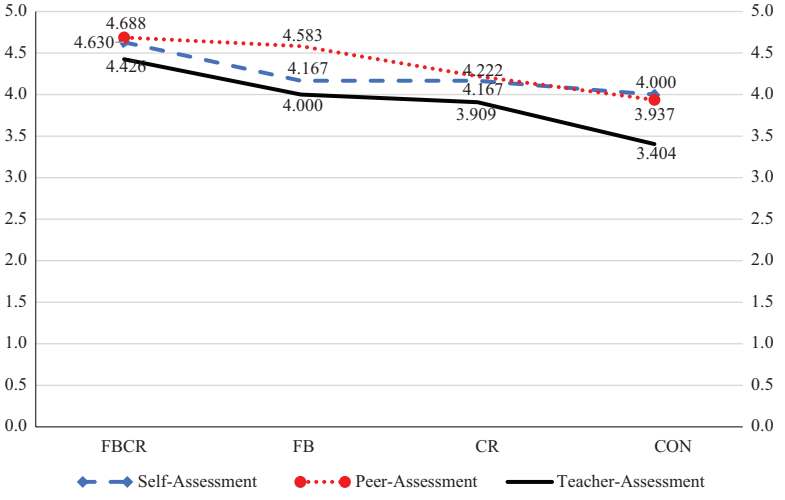

Figure 3 Research ethical behavior among students receives feedback and criteria of plagiarism behavior checklist differently

Discussion and Conclusion

The main findings indicate that the instructional package helped students to enhance their knowledge of plagiarism and awareness. These results are consistent with Srisongkram (2011), who found that students receiving the research ethics program had significantly higher scores on plagiarism understanding than those who did not participate in the program. Other studies showed that students had better knowledge and awareness after participating in the teaching of academic integrity and a campaign to raise awareness of the importance of plagiarism and research ethics (Curtis et al., 2013; EI-Shinawi et al., 2016; Smedley et al., 2015). This is also aligned with the recommendation of Madray (2007), who encourages universities to provide a program to enhance academic integrity skills for inexperienced students. For this reason, teachers are encouraged to promote the importance of research ethics and plagiarism in the classroom in order to prevent students from committing unethical behavior and avoid plagiarizing other people's work.

Results from ANOVA and ANCOVA indicate that the experimental group gained more knowledge than the control group. Still, no difference was found in relation to plagiarism awareness between the two groups. However, this research found that students receiving the instructional package showed no significant difference in plagiarism awareness between the groups. Additionally, the university campaign on avoiding plagiarism, and other lecturers may discuss topics related to research ethics. Therefore, students in both groups showed no significant difference in plagiarism awareness. This indicates that the instructional package is one of many ways to increase plagiarism awareness. Other methods to enhance plagiarism awareness include traditional teaching methods, research proposal feedback, university campaigns through websites or books, and discussions with other teachers.

The RLTD course provided the topic for research proposal writing during the fifth week of the course, whereas plagiarism and research ethics topics were provided during the last two weeks. For this reason, plagiarism behavior could not be checked at the beginning of the course, while plagiarism knowledge and awareness were pre-tested. Plagiarism behavior was directly measured from research proposal writing. Assessment criteria and feedback on research proposal writing helped students become more aware of plagiarism. Even though the control group did not get the instruction package, traditional teaching methods and lectures could help students become concerned about plagiarism. The study by Henslee et al. (2015) also confirms that an online tutorial and a pre-recorded lecture are equally effective in enhancing students' academic integrity.

As a result of this, the current study found no significant difference in plagiarism awareness between the controlled and experimental groups. It is recommended that future research courses start with research ethics and plagiarism topics in the beginning, prior to contents related to research proposal and report writing.

Teacher feedback helps students improve research ethical behavior. Those receiving feedback committed less plagiarism than those who could not send their research proposal on time and did not receive feedback. When students assess their research proposals by themselves (self-assessment) and assess their peers' work, this process helps students know and understand the evaluation criteria for research proposals. Furthermore, as the researcher announced that scores from self-assessment and peer assessment would not be counted on grading in this course, the result was that the scores from different sources, such as students, peers, and teachers, were more significantly related.

The three types of assessment used (teacher, self, and peer) yielded similar results. Students receiving both feedback and assessment criteria had higher scores in research ethical behavior than the other groups. This finding corresponds with previous findings found in the literature review related to formative assessment or assessment for learning to enhance students' achievement (Arwae, 2012; Black & William, 1998; Cauley & McMillan, 2010; Lumthong, 2010; Maeteepithaktham, 2012; Panurat, 2010; Popham, 2008). Besides, Panurat (2010) found that self-assessment using a checklist, and an open-ended questionnaire helped students improve their writing skills. Lumthong (2010) also found that students obtaining feedforward or information to improve their work helped increase students' visual art development. Many studies also revealed that peer feedback helped Thai students enhance their writing skills (Arwae, 2012), and students receiving elaborative and suggestive feedback were better at problem-solving skills than those gaining corrective feedback (Maeteepithaktham, 2012). Furthermore, research-based learning helped undergraduate students enhance their knowledge and academic performance (Brew & Jewell, 2012; Sumbawati & Anistyasari, 2018; Walkington et al., 2011).

The instructional package should comprise learning objectives, teaching process, teaching materials, and assessment in all lesson plans (Supaprot, 1995). The package would help students gain a better understanding and awareness of plagiarism and avoid committing plagiarism when conducting research. The literature review suggested that learning package development should stimulate students' interest in the learning package by using multimedia tools such as news, pictures, video clips, and online materials. These multimedia tools make the classroom more interesting than traditional teaching methods (Jatuverapong, 2012; Srikaewkul, 2002; Suwannawaj, 2011). Development of an instructional package is one way to create a better understanding and concern about research paper writing without plagiarism at the undergraduate level instead of teaching this topic at the graduate level in Thailand.

Recommendation

Teachers should take action by making plagiarism an explicit topic in their lessons. This could help students understand why it is important to acknowledge other people's work. Teachers are also encouraged to explain and provide models on how to paraphrase and cite original sources, as well as provide the opportunity for students to write actual research papers. It is also important for teachers to evaluate students' written drafts before they complete their final papers and try to inform them of the plagiarism acts in their papers. Moreover, students should be taught how to search the internet in order to locate and use information from reliable and trustworthy sources (Evering & Moorman, 2012). If possible, further research should measure plagiarism through plagiarism checkers or AI-assisted tools after implementing the instruction package.

Conflict of Interest

The author declares that there is no conflict of interest.

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