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Bridging the gap between face-to-face and virtual class: What to be considered in the course of scientific writing?

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Abstract: This systematic review attempts to summarize articles that provide information for lesson planners and curriculum development to consider in the design and development of virtual classes for scientific writing. A qualitative research methodology was employed to analyze the information gathered to answer two research questions. The protocol in the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) was incorporated to provide a carefully planned and recorded systematic review to ensure consistency, openness, accountability, and integrity of review articles. The results signify considerations for designing scientific writing, including personal assistance and guidance for the preparation of paper writing and submissions. The analyzed articles also recommend facilitating students with their preference-based activities and building interactivity.

Keywords: English language teaching, scientific writing, virtual class, writing skills

Abstrak: Tinjauan sistematis ini mencoba merangkum artikel-artikel yang memberikan informasi bagi perencana pembelajaran dan pengembangan kurikulum untuk dipertimbangkan dalam perancangan dan pengembangan penulisan ilmiah kelas virtual. Metodologi penelitian kualitatif digunakan untuk menganalisis informasi yang dikumpulkan dalam upaya menjawab dua pertanyaan penelitian. Protokol dalam Item Pelaporan Pilihan untuk Tinjauan Sistematis dan Meta-analisis (PRISMA) dimasukkan untuk memberikan tinjauan sistematis yang direncanakan dan dicatat dengan cermat untuk memastikan konsistensi, keterbukaan, akuntabilitas, dan integritas artikel tinjauan. Hasil penelitian ini memberikan pertimbangan dalam merancang penulisan ilmiah, termasuk asistensi personal dan bimbingan dalam menyiapkan dan men-submit. Artikel-artikel yang dianalisis juga merekomendasikan untuk memfasilitasi mahasiswa dengan aktivitas berdasarkan preferensi mereka, dan membangun interaktivitas.

Kata kunci: pengajaran bahasa Inggris, penulisan ilmiah, kelas virtual, keterampilan menulis

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INTRODUCTION

The Covid-19 pandemic has presented both possibilities and uncertainties to higher education. Among others is the rise of Emergency Remote Teaching (ERT). With ERT, higher education has tremendous opportunities to rethink its role in assisting students and advocate for them to become more active agents in the development of social autonomy and self-regulation in learning (Rapanta et al., 2021). One viable option is to use teachers' ERT experiences to bridge the gap between online and face-to-face (henceforth F2F) instruction.

Taking the characteristic of virtual class proposed by Hiltz (1986), the ERT has the potential to provide access to an interactive communication and learning space within the web system. The characteristic of teleconferencing is expected to be the universities' ability to handle time zones and geographical differences. In the development of virtual classes as the technology to enhance language learning, several benefits have been revealed i.e., 1) as the supplement to traditional F2F class curriculum (Michael, 2012); as the supporter of the global learning plan at which students practice various aspects of their global competencies

(Patterson et al., 2012); as the typical classroom for distance students (Xenos, 2018); and as a strategy to reduce the frequencies of F2F in-class meeting (Palvia et al., 2018); and as a solution to sustain teaching delivery during national/ global disaster (Gross et al., 2023).

There were three models a virtual classroom shall be managed: 1) blended/ hybrid model; (2) supplemental model; and (3) classroom-based model (Palloff & Pratt, 2013). Blended models are the most familiar model of virtual classrooms. It has often been used to minimize F2F meetings to benefit students' learning autonomy development. It is common to have fewer frequencies of the F2F than the virtual class. Yet, the models have also brought forward ambiguity in the sense of what should be blended or combined (Hrastinski, 2019). The second model, supplemental models, is more to fulfill curricular gaps. As its name signifies, the model is supplementary to F2F. The last model, classroom-based models emphasizes integrating technology and face-to-face classroom. It leverages the use of technology to improve classroom delivery using purchased online courses to engage all students online while in the face-to-face environment (Palloff & Pratt, 2013), and provides more opportunities for those who cannot attend F2F class (Dos Santos, 2022).

The trend of virtual classrooms is also emerging in scientific writing courses. Vasset et al. (2024) highlighted that the scientific writing model necessitates appropriate virtual platforms for more effective implementation, in which the platforms are predicted to enable students to formulate their ideas in a more personalized setting. Considering the matters that mastering such skills will require patience, motivation, critical thinking, and adherence to high-quality standards (Bourne, 2005), proper and careful planning and implementation should be performed.

An irony is that writing and publishing scientific papers are terrifying for students, even scientists. They are skeptical of the unwritten norms, implicit dogma, and curiously complex style that appear to dominate standard scientific writing thought (Lindsay, 2020). In practice, they find it difficult how to turn an outline into a full paper (Grogan, 2021). Students who attempt to write and publish scientific writing also face similar difficulties as they lack both skills and experience for scientific paper construction (Nurbayan et al., 2022). For worse, writing for publication is rarely included in the educational curriculum (Simon et al., 2020).

Regarding this fact, scientific writing courses are supposed to be officially part of the university curriculum to bridge the urgency of improving scientific writing skills. The courses should be designed and prepared to theoretically and practically equip scientists or students for scientific publication. The process includes reading high-quality scientific publications; learning the fundamentals of research, developing and carrying out hypotheses; interpreting and presenting research findings with flair, accuracy, and grammar; articulating and delivering research findings succinctly and effectively; giving careful thought to the details, writing clarity, and objectivity; reporting organized data, such as background and treatment administered (Balakumar et al., 2013; Hoogenboom & Manske, 2012). In other words, in scientific writing courses, students should be equipped with scientists-like competencies (Stengel et al., 2021).

This systematic review tries to summarize articles that provide information for lesson planners and curriculum development to consider in the design and development of a scientific writing virtual class. The information should be based on lecturers' experiences in ERT as the bridge to the gap between F2F and online teaching. The summary is essential as

a starting point and is beneficial for the further step guideline in designing and developing the scientific writing virtual class. The reviews are taken from study reports of F2F and online learning settings (during the pandemic), with a projection that the results will enlighten educators or stakeholders for a wider and more effective delivery mode of learning.

METHOD

This study employed a qualitative research methodology incorporating a search approach to discover articles to be reviewed to answer research questions. As a systematic review, this study followed the protocol in the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) (Page et al., 2021). The protocol provides a carefully planned and recorded systematic review to ensure consistency, openness, accountability, and integrity of review articles. Furthermore, this research combined a procedure that includes identifying data sources for search, keywords for search, and inclusion criteria.

Literature search

A quality systematic review begins with the database quality used to identify the articles to be selected. This requires a careful search and review of the existing literature from various journal databases. The journal database used for this review was Publish or Perish (PoP). Article search was done based on the suitability of the title and abstract with keywords, while the selection of articles was based on whether or not the articles could answer the research question. The researchers believed using these two criteria might ensure the validity, reliability, and quality of the review.

Criteria for inclusion/ exclusion in the literature review

Several keywords were used in the literature search. They are namely: “virtual class”, “language virtual class”, and “scientific writing”. To filter the search results, several criteria were set for articles that were included or excluded in the meta-analysis. There were two criteria taken as the focus i.e., eligibility and inclusion:

1. Articles were published between 2021 and 2022;
2. Only articles marked as the most cited articles or had the highest h-index were included in the review;
3. The title and content of the abstract should contain “virtual class”, “language virtual class”, and “scientific writing”;
4. Articles should have been published in Scopus-indexed journals;
5. Articles are sourced from research conducted in the context of formal education and higher education;
6. The article focused on learning and instructional strategies.

Article screening protocol

The number of articles from the keyword search database was reduced according to the elimination procedure described as follows:

1. The elimination was because of duplication from various journals,
2. The elimination of the article was carried out because the title and content of the abstract did not match the criteria for inclusion of the article (criteria number 3, and 5)

3. This led to a reduction from 125 articles to 28;
4. Full text checking through article accessibility reduces articles to 6;
5. Finally, there were only 6 articles included in this systematic review.
6. The elimination procedure is shown in Figure 1 which shows the flow of the article screening protocol.

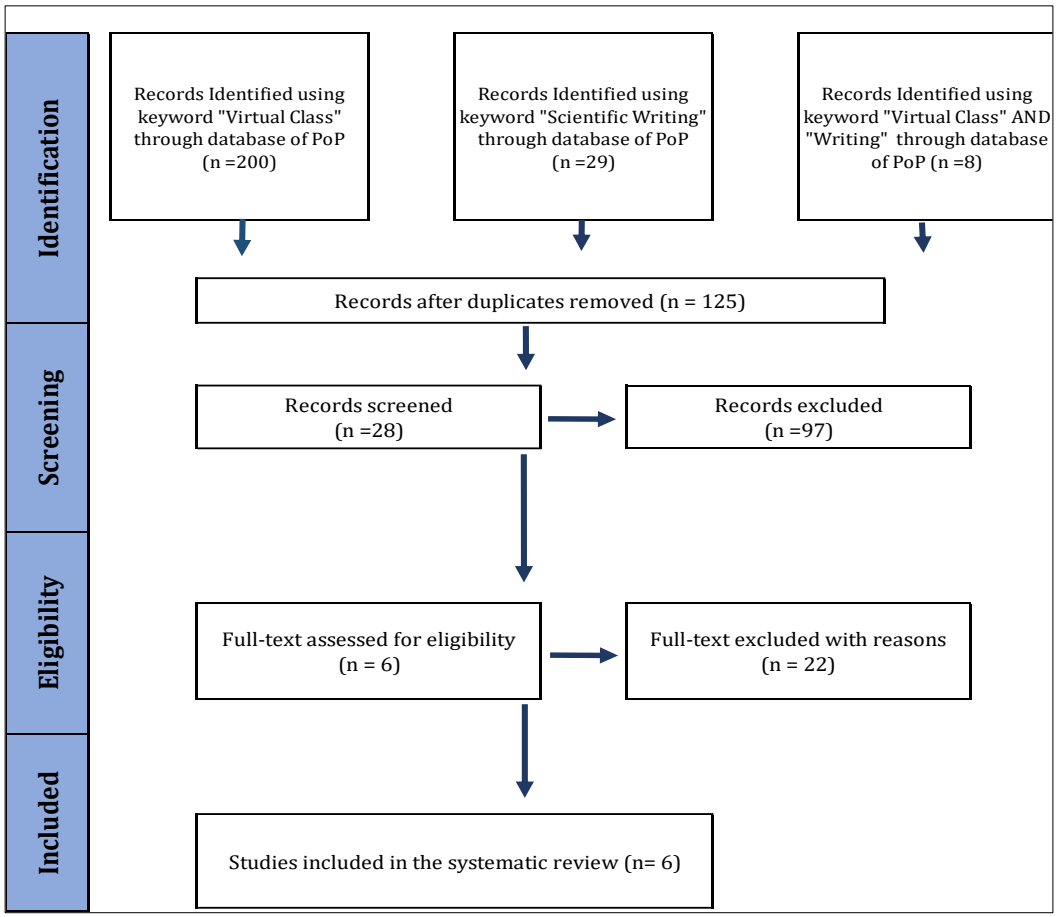

Fig 1. The procedure of the systematic review using the PRISMA Protocol

The following are the articles analyzed in this systematic review. Articles 1 and 2 were studied to answer research question 1, while articles 4-6 were analyzed to provide answers for research question 2. The six articles are presented in Table 1.

Table 1. Articles included in the systematic review

No.	Articles	Research Questions
1.	How to write and publish a research paper for a peer-reviewed journal (Busse & August, 2021)	What is to be considered in writing scientific papers?
2.	Twelve tips for students who wish to write and publish (R. K. Sharma & Ogle, 2022)	
3.	Who's there? characterizing interaction in virtual classrooms (Willermark, 2021)	What recommendations and

4.	Transformation of learning from real to virtual: An exploratory-descriptive analysis of issues and challenges (Rizvi & Nabi, 2021).	strategies should be considered in the virtual class?
5.	Combining the best of online and face-to-face learning: Hybrid and blended learning approach for Covid-19, post-vaccine, & post-pandemic world (Singh et al., 2021)	
6.	What to blend? Exploring the relationship between student engagement and academic achievement via a blended learning approach (Argyriou et al., 2022).	

RESULTS AND DISCUSSION

What is to be considered in writing scientific papers?

To answer the first research question, two studies were analyzed. The two studies were conducted by Busse and August (2021), and Sharma and Ogle (2022). The results of the analysis are provided in Table 2.

Table 2. Consideration in writing scientific papers

Articles	Consideration	
Busse and August (2021)	1. Do you write for a particular journal audience? 2. Do you follow the introduction pattern (upside-down triangle)? 3. Is the purpose of the research concise and insightful? 4. Do you carefully clarify the dependent and independent variables, as well as any factors or descriptive categories used in the designs and findings? 5. Do you validate your methods, including sample and variable selection, estimation, and statistical analysis? 6. Do you present the findings in terms that suggest a trend of associations? 7. Are the table headings and figure captions complete? 8. Does the findings section highlight major conclusions from tables and figures, rather than duplicating them literally? 9. Do you avoid duplicating specific results or offering new findings in the discussion section? 10. Do you address constraints and implications, preserving your approach when necessary? 11. Are the future procedures you recommend specific? 12. Do the research objectives, methods, findings, and discussion align? 13. Is the title of your article informative and captivating? 14. Do you correctly cite literature within the manuscript?	Manuscript checklist
	1. Selecting a target journal at the beginning of drafting the manuscript 2. Identifying author roles early in the process 3. Structure of the introduction section 4. Methods section 5. Results Section 6. Discussion Section	Sections to write scientific papers

Sharma and Ogle (2022))	1. Find your motivation or why students decided to participate in research. It is believed that learning to do research and to improve their accompanying abilities of critical evaluation and writing will personally better results. 2. Play to your strengths and be realistic. A small proportion of forethought and preparation at this point will provide a far more welcoming beginning to the research process. Give considerations to personal abilities and interests that may apply to research work. 3. Be well-read. Reading is a must. To make the research process much easier, you have to locate and read dozens of relevant publications and be analytical at once. 4. Revisit missed opportunities. Explore and be well-informed of modules that cover all stages of research, from designing the study idea through ethical approval, completion, and presentation. 5. Talk to the research practitioners in your field. Reconsider before rejecting the opportunity to participate in an audit or study just because it does not result in an immediate publication. The result of the audit can lead to the potential research conducted. 6. Broaden your horizons. A component of reviewing literature is to dig further into the world of research and become literate in the range of publications and research writing styles. 7. Master the submission process early. The process of manuscript publication starts from choosing the right journal which is not an easy task. An experienced tutor can give the best assistance for beginners to become familiar with the submission process. 8. Pay attention to the details. This tip is intended to direct your attention to all the potential questions and things to watch out for when submitting to your selected journal. 9. Remember that submission is not the end. Rarely are journal manuscripts approved without revisions. There are four possible decisions: acceptance, minor revisions, major revisions, and rejection. 10. The process cannot be rushed. Not only may the preparation of an article be time-consuming, but it can also take days before an editor evaluates the piece and weeks before the first response is received. 11. Consider alternative paths to present the research report. It is essential to emphasize the significance of various scientific methods. A complete manuscript is very time-consuming and has a relatively low rate of success; nonetheless, the great majority of research projects may be presented as scientific posters or oral presentations but are not. 12. Begin writing.	Personal tips for students to start writing and publishing scientific papers

Referring to the data in Table 2, Busse and August (2021) propose a checklist for writers as the guidelines to revise, edit, and assure quality writing. In addition to the checklist, this article offers comprehensive ways of selecting a target journal, providing guidance on authorship, identifying frequent mistakes, and providing recommendations and guidelines for each section. They also list six sections to focus on in writing and publishing the scientific paper, not only when scientists or researchers start writing their draft, but also from select target journals. These six sections are significant to discuss in the scientific writing course so that new scientists or students can write in an appropriate segmentation. Proper segmentation might help authors to communicate their ideas smoothly. Moreover, considering that scientific writing cannot be completed in a short time, segmentation will aid in dividing up course levels. The second article, written by Sharma and Ogle (2022), the concern is on personal tips to start writing scientific papers. Those new to scientific writing and publication are encouraged to find personal motivation and strengths to write. Expanding the horizon of research through reading and consulting the experts can also be a helping hand for authors. Comprehending the submission process before starting to write is urgent to sharpen the research objectives.

Based on the two articles, the main conclusion is that the scientific writing course is quite time-consuming. Instructors or teachers might spend quite a long time assessing their students' writing (Ponce & Moorhead, 2020). Whereas, students also need a length of time to draft their paper, perform revision (Hotaling, 2020), and finally communicate their discovery (Grogan, 2021). Therefore, it might need more than two levels in the writing course implementation.

The writing course will focus on two objectives: focusing on the preparation for scientific papers and focusing on preparation for manuscript submission. As proposed by Guilford (2001), and Turbek et al. (2016), scientific writing stresses crafting a manuscript, adjusting to a scientific writing template, and processing to submission. In short, multiple competencies are needed to construct a good piece of scientific writing; knowledge of the field, writing skills, scientific guidelines understanding, analysis, and reporting ability (Sharma, 2010).

At both the above levels of paper writing and submission preparation, personal assistance should be provided as scientific writing is characterized by context-based and community-based. The absence of personal assistance when composing the paper commonly leads to failure in publishing the paper (Amobonye et al., 2024). The context should be in line with the aims and scope of the journal. Meanwhile, the subscribed readers and readers directed by search engines are in the same community with a similar purpose to fulfill by the journal. The two characteristics should be the first requirement introduced to students.

What recommendations and strategies should be considered in the virtual class?

In this section, four articles were analyzed to answer the second research question. The findings from the four articles are displayed in Table 3.

Table 3. Considerations for virtual classes

Articles	Consideration	
Willermark (2021)	1. The increase in attendance frequencies 2. The increase in students' class involvement 3. Interaction disclosure	Increase in interaction
	1. A decrease in attendance; 2. A decrease in involvement and 3. The involvement shield	Interactivity
Rizvi and Nabi (2021)	1. Insufficient bandwidth and connection difficulties; 2. Unsupported home situation for virtual class; 3. Students' feeling isolated and demotivated due to the absence of face-to-face interaction; 4. Excessive screen time causing fatigue; 5. Time management; 6. Absence of an e-library; 7. Difficulty comprehending things involving calculations and 8. Device failure.	Challenges faced by students
	1. Real-time lecture delivery by the course professors; 2. Article/case study/discussions facilitated live by the course professors; 3. The provision of self-study material via email/WhatsApp/Google Classroom, etc; 4. The provision of recorded lecture videos; 5. The supply of topic-related videos from YouTube etc (non-lecture video); 6. A blend of certification courses via other education portals; and 7. A complete substitution of real classes into online classes with certification courses through education portals.	Students' preference for teaching/learning methods of virtual classes
Singh et al. (2021)	Strengths 1. Self-accountability 2. Self-pace 3. Accessibility for disabled students 4. Virtual learning for most 5. Safely learn and interact 6. Autonomy Weaknesses 1. Lack of student buy-in 2. Minimal interaction 3. Work ethic complacency 4. Lab requirements 5. Compromised software	SWOT analysis of blended/hybrid learning

	6. Timeliness of interaction Opportunities 1. Technological advances 2. Cloud-based potential 3. Multiple course facilitation 4. Creativity 5. Mixed software platforms 6. Synergy Threats 1. Technologically compromise 2. Computer compatibility 3. Personal integrity 4. Subject matter buy-in 5. Software options/costs 6. Technically challenged individuals	
Argyriou et al. (2022)	Online learning tools improve student engagement and performance.	Effect of online learning tools

The first article analyzed is the work of Willermark (2021). The discussion is divided into twofold: aspects to increase and decrease interaction. There are three aspects identified to increase virtual class interaction including attendance frequencies, class involvement, and interaction disclosure. The disclosure from this article is a reflection of students' activeness or passivity. The virtual classroom has given larger opportunities for teachers to observe and monitor students in a more personal manner. Therefore, teachers must promote interactivity with their students during the virtual classes (Ong & Quek, 2023). Meanwhile, three aspects indicate a decrease in virtual classes, which encompass a decrease in attendance, involvement, and the involvement shield. From this perspective, involvement shields are relevant to the decrease in students' participation. Teachers indicate that this abstract shield prevents them from observing and monitoring behind students' computer screens. Another indication was that widespread cheating is occurring as technology-mediated learning provides students with new and more ways to do cheating. As reported by Cotton et al. (2024), dishonesty and plagiarism have become raising concerns in the use of technology-enhanced learning.

The second article authored by Rizvi and Nabi (2021) discusses the strive of educational practitioners to transform their real concrete classes into virtual web-based classes during the COVID-19 pandemic. Challenges faced by students online cover virtual supporting facilities, learning environmental issues, students' internal motivation, teacher-student interactivity, students' well-being, and classroom management. These challenges might bring students to demotivation, or even experience writing blocks. As a consequence, teachers should design the course with facilitation strategies in the form of remote learning assistance (Chimbo et al., 2023). Another important finding from this article is students' preference for teaching/learning methods of virtual classes. The article also highlights the methods preferred by students, which range from synchronous lectures and discussions, learning materials provision, to class shifting (F2F into online courses). Such preferences can be further expanded into need analysis (Madu et al., 2023) for further analysis in

designing and developing curricula. By implementing need analysis in advance, the developed curriculum of the course is projected to be concise, effective, and efficient.

The third article by Singh et al. (2021) presents a SWOT analysis relevant to online teaching in universities including in the pandemic period. Some recommendations can be generated from the SWOT analysis involving students, lecturers, and the university and government as stakeholders. For students, the recommendations proposed are connected to promoting students' collaboration and presence, either socially or cognitively. Working collaboratively during the writing process is considered pivotal for interaction among learners (Afrezah et al., 2024). Social and cognitive presence also serve as keys in virtual classes (Singh et al., 2022). For lecturers or instructors, considering personalized content, students' orientation for online learning, presence, assessment, and evaluation are pivotal. University management should consider maintaining lecturers' and student's mental health and providing sufficient support for virtual learning. On the account of general education policy, the government should play a role in regulating and generating guidance for virtual learning, so that university management might refer to this policy. In short, connecting to the idea of virtual scientific writing courses, to design and develop a quality course, not only do learners and instructors need to be involved, but also authority or stakeholders including government and university management, who will define general curricular objectives. Besides improving students' competence in writing, the involvement of authority could also communally build the culture of conducting, reporting, and publishing research, as a part of communicating the discovery to the public (Somashekhar, 2020) or beyond the academia (Grogan, 2021).

The next article, reported by Argyriou et al. (2022), examines whether student participation in various online blended learning activities affects academic success. Findings are highlighted in connection to using online learning tools to improve student engagement and performance and learning analytics to identify students in need of more assistance. Since just one significant predictor was identified in the data, future study is necessary to determine other variables impacting academic accomplishment in an online blended learning environment. Furthermore, students' participation in scientific writing will be a determinant of the quality of writing. Students with less participation might not get sufficient feedback for their writing revision. Meanwhile, participation and feedback (Márquez et al., 2023), including types of feedback delivered to students (Sahmadan & Hasan, 2023), are pivotal to promoting learning performance.

In brief, from the four articles reviewed, the notion of interactivity, students' challenges and preferences, strengths-weaknesses-opportunities-threads, and participation should become priority points of consideration in setting or designing online scientific writing courses. In practice, the scope of these pointers might get wider or narrower due to different learning environments. University curriculum developers, in a wider scope, might take the recommendations as evaluation tools for the previous scientific writing courses to better design new models for effective scientific writing courses.

CONCLUSION

There are several conclusions made based on the findings. First, personal assistance is a must in a course of scientific writing. The lesson planning should consider interactive activities on teacher-student discussion on the two objectives of the scientific writing

course: focusing on the preparation for a scientific paper and focusing on preparation for manuscript submission. Second, the planned activities should ensure that students' preferences for teaching/ learning methods have been in the consideration. As in the virtual class, student-led activities can generate interactivity. Third, there might be less real teacher-student interaction and student-student interaction in virtual classes. Digital resources can be the solution for teachers to overcome the backwash effect.

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