

ENHANCING RESEARCH EFFICIENCY WITH ZOTERO IN POSTGRADUATE ENGLISH LINGUISTICS STUDIES

NÂNG CAO HIỆU QUẢ NGHIÊN CỨU VỚI ZOTERO
TRONG CÁC NGHIÊN CỨU SAU ĐẠI HỌC NGÀNH NGÔN NGỮ ANH

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ABSTRACT

This article reports the impact of Zotero, the designated reference management tool, on the efficiency of graduate students concentrating in English linguistics. The objective was to evaluate Zotero's efficacy in facilitating students' academic pursuits, including citation and bibliography management, collaboration, and related tasks. Ten graduate students conducted a seminar on using Zotero's functionalities, including establishing a reference library, integrating with word processing applications, and implementing cloud-based synchronisation. A systematic questionnaire was utilised to evaluate Zotero's influence on these factors. The findings indicate that students demonstrated improved efficiency in managing their academic papers and utilising resources, particularly with the automation of citation formatting and data extraction. The results suggest that incorporating Zotero into graduate curricula significantly enhances research capabilities, thereby supporting learners in developing strong academic writing and organisational skills. Future studies are recommended to comprehensively explore Zotero's integration with other digital tools and its effectiveness across various academic fields, and to evaluate its impact on research productivity.

Keywords: *Zotero, postgraduate students, research efficiency, academic writing, digital tool integration.*

TÓM TẮT

Bài báo này nhằm xác định tác động của Zotero, một công cụ quản lý tài liệu tham khảo, đối với hiệu quả nghiên cứu của học viên sau đại học chuyên ngành Ngôn ngữ Anh. Mục tiêu của nghiên cứu là đánh giá mức độ hiệu quả của Zotero trong việc hỗ trợ các hoạt động học thuật của người học, bao gồm quản lý trích dẫn và tài liệu tham khảo, hợp tác nghiên cứu cũng như các nhiệm vụ liên quan khác. Mười học viên sau đại học đã tham gia một buổi tập huấn về cách sử dụng các chức năng của Zotero, bao gồm xây dựng thư viện tài liệu, tích hợp với các phần mềm soạn thảo văn bản và áp dụng cơ chế đồng bộ hóa dựa trên nền tảng đám mây. Một bảng câu hỏi được thiết kế có hệ thống đã được sử dụng để đánh giá ảnh hưởng của Zotero đối với các khía cạnh nêu trên. Kết quả nghiên cứu cho thấy, người học có sự cải thiện rõ rệt về hiệu quả trong việc quản lý bài viết học thuật và khai thác tài liệu, đặc biệt nhờ vào tính năng tự động hóa định dạng trích dẫn và trích xuất dữ liệu. Những phát hiện này cho thấy việc tích hợp Zotero vào chương trình đào tạo sau đại học có thể nâng cao đáng kể năng lực nghiên cứu, qua đó hỗ trợ người học phát triển kỹ năng viết học thuật và kỹ năng tổ chức một cách vững chắc. Các nghiên cứu trong tương lai được khuyến nghị nhằm tiếp tục khám phá sâu hơn khả năng tích hợp Zotero với các công cụ số khác cũng như đánh giá hiệu quả của công cụ này trong nhiều lĩnh vực học thuật khác nhau, từ đó xem xét tác động của nó đối với năng suất nghiên cứu.

Từ khóa: *Zotero, học viên sau đại học, hiệu quả nghiên cứu, viết học thuật, tích hợp công cụ số.*

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1. INTRODUCTION

Maintaining references, collating citations, and archiving sources pose some of the most pressing

difficulties that graduate students face, and these difficulties are exacerbated if the student is in Linguistic studies, as the issue entails dealing with vast amounts of

data and synthesising different academic paradigms to produce valuable research papers [1]. According to [2], managing a large number of materials can impede thorough evaluation, and the additional work of sorting citations by hand is tedious and prone to error. This concern even worries students who frequently use many scholarly sources in their studies [3].

To address these challenges, tools like Zotero can help manage references. Zotero has created new opportunities to enhance research efficiency by eliminating human influences, reducing time, and conserving energy [4]. However, a knowledge gap exists regarding how graduate students from English linguistics disciplines understand Zotero both technically and in terms of its practical effects on their academic work.

Linguistic postgraduate students in Vietnam face similar challenges in managing references and citations. The widespread adoption of reference management software, such as Zotero, has not yet become consistent with university research practices that incorporate technology. Most students continue to use manual referencing, which makes their research procedures less efficient. Students must learn proper referencing techniques because Vietnamese postgraduate courses value independent research investigations. The study of Zotero utilisation by Vietnamese postgraduate students reveals key trends in digital tools in academic research.

Hence, this research aims to examine the role of Zotero in reference management and citation among graduate students in English linguistics. Thus, the purpose of this study is to investigate students' experience and satisfaction with using Zotero, to ascertain whether the tool is beneficial to the students' research process and whether it helps solve typical problems associated with incorrect handling of references and an inefficient citation process, as highlighted in the literature [5].

To achieve the outlined aim and objectives, the following overarching research questions have been put forward:

1. What are postgraduate students' perceptions of Zotero software?
2. How do postgraduate students in English linguistics use Zotero to store and cite academic references?

2. LITERATURE REVIEW

2.1. ICTs in Academic Research

ICTs refer to tools and techniques for storing, processing, and transforming information, including

computers, application software, networks, and online databases. In Academic Research, ICTs have brought significant changes in how research is conducted by enhancing knowledge approaches, study effectiveness, collaboration, and research data management.

Regarding accessibility, ICTs play a crucial role in enabling researchers to access online data, scientific journals, and academic research from various institutions. Based on this, researchers can analyze vast amounts of data from different fields and advance their professional knowledge [6]. In addition, tools analyzed based on ICTs, such as SPSS, NVivo, and MATLAB, also support both quantitative and qualitative research, enabling the processing and analysis of complex data with high accuracy and systematic rigor [7]. Moreover, ICTs are also crucial for enhancing academic collaboration. Digital communication and cloud-based platforms enable researchers in different locations to share documents, exchange ideas, and collaborate on their research projects [8, 9].

2.2. Research Efficiency in English Linguistics

Research efficiency in Academic Research refers to the level at which researchers can complete research assignments while optimizing time, effort, and resources, while ensuring the accuracy and academic and scientific quality of the study. Research efficiency is not solely about the speed of study completion, but also encompasses document management, citation precision, consistency of references, and a focus on core academic analyses [10].

In English Linguistics, research efficiency has specific characteristics. Post-graduation students need to process a vast amount of theoretical literature, including background works, various linguistic schools, and relatively experimental research. The process of reading, clarifying, comparing, and citing these documents requires high accuracy and is time-consuming. If there is no suitable support tool, it is challenging for students to follow reference sources, maintain consistency in referencing, and reduce citation mistakes, which, in turn, decreases the effectiveness of research in general [11].

2.3. ICTs in References and Citations of Academic Research

In-text citations and references are core components of academic research, contributing to the reliability of research and to ethical considerations through data transparency. References provide comprehensive

information about sources, while in-text citations establish a clear connection between theoretical points and relevant research evidence. The development of ICTs has significantly enhanced citation through digital data management tools. These tools help increase the accuracy, coherence, and effectiveness of the citing process by automatically documenting the format and organizing systematic references [12]. By reducing manual work and errors, ICT-based data management systems enable researchers to focus more on analysis and the academic logic of the research.

2.4. Data Management Tools In Academic Research

Reference management tools such as Zotero, Mendeley, and EndNote are considered outstanding apps in ICTs for academic research. These tools help users collect, organize, and cite references effectively, support a wide range of citation styles, and integrate seamlessly with document processing software. Additionally, the application of reference management tools presents some challenges. Users require time and technical support to achieve a particular level of fluency, while issues with compatibility across multiple academic databases may compromise the effectiveness of these tools. These limitations underscore the need for systematic training courses and institutional support to ensure the positive impact of ICT-based reference management tools and academic research practices [13].

2.5. Zotero in Academic Research

Zotero is a widely used, open-source reference management tool designed to support organizing bibliographies, in-text citations, and references. Zotero has plug-in extensions that work in the browser and applications that run on the user's computer, enabling users to collect targeted data from academic databases without requiring internet access [10, 11].

Previous studies have indicated that Zotero offers numerous significant benefits, including reduced specific citing errors, time savings, and support for maintaining academic integrity [14]. However, according to Nicholas et al. [10], users, especially first-time users, can face technical challenges related to database integration, reference management, and numerous bibliography organisation.

Although numerous studies have discussed the roles of ICTs and data management tools in academic research, there is a lack of experimental studies examining the impact of Zotero on research efficiency among postgraduate students in English linguistics. Previous

studies have largely focused on the technical benefits of Zotero, such as automatic citation and reference management, without systematically investigating its impacts on research workflows, cognitive load reduction, or long-term research efficiency. Moreover, this field has a particular speciality in document mass, with strict citing requests and the connection between quantitative and qualitative research. This doesn't fully analyse in reference management studies. As a result, there is a clear need for awareness-raising and the use of Zotero among master's students in English Linguistics, from which we can evaluate the extent to which this tool affects the effectiveness of academic research. The present study was conducted to fill the gap and contribute evidence on the use of ICTs in post-graduation.

3. METHODOLOGY

This study was conducted in a postgraduate English language classroom at a university in Hanoi, Vietnam. The participants were 10 postgraduate students from the Master's program in English Linguistics, attending the course on Information and Communications Technologies (ICTs), a compulsory subject in the English Linguistics Master's program, which enables students to develop the linguistic competency essential for ICT and apply ICT technologies in their learning and research projects. All participants were exposed to Zotero to a limited extent. The limited number of participants was decided upon to ensure that the information gathered is targeted and as diverse as possible, so that their opinions and attitudes towards using Zotero in their academic activities can be effectively evaluated and analysed.

3.1. Design of the Study

The factors associated with the use of Zotero in the learning process of postgraduate students were examined using a quantitative research methodology to ensure an objective and systematic perspective. This methodology facilitates the acquisition and analysis of quantitative data, yielding definitive, trustworthy results. Quantitative research enables the examination of hypotheses regarding software usage experiences, efficiency metrics, and the challenges students face when using Zotero.

This sequence of procedures comprised the investigation process: A 15-question questionnaire was developed to collect data on students' perceptions and experiences with Zotero. The inquiries were categorised into distinct measures to assess factors ranging from satisfaction levels to utilisation frequency and the difficulties encountered when using the software.

3.2. Data Collection and Analysis

Data were gathered using a 15-question self-administered questionnaire designed to assess students' perspectives and experiences with Zotero. The questions included nominal, ordinal, and Likert scales to measure different aspects, such as usage frequency, satisfaction level, and the problems students faced when using the software.

The study participants' data were analysed immediately after collection using Google Forms. The analytical approaches involved identifying the frequency distributions to determine students' choices, as well as the means and standard deviations of their satisfaction levels and perceptions. These methods enabled the receipt of an extensive and impartial description of students' interactions with Zotero during their learning process.

4. RESULTS AND DISCUSSION

This study focused on analysing students' usage levels, frequency, benefits, effective progress in studying, challenges, and expectations after approaching and using Zotero. Firstly, according to Zotero usage results, 30% of students reported never using Zotero, while 70% stated they had used it for less than 1 month (Table 1).

Table 1. Usage Levels of Zotero

Zotero Usage Status	Percentage (%)
Never used	30
Used for less than 1 month	70

Table 2. Frequency of Zotero

Frequency of Zotero Usage	Percentage (%)
Daily	10
Weekly	50
As-needed	40
For work	70
For research	60

Regarding use frequency, although Zotero's awareness among students was relatively high, actual use remained low. Only 10% of students used Zotero every day. 50% used it at least once a week, and 40% used it only in response to specific requests during the learning or studying process (Table 2). Additionally, regarding the purpose of use, 70% of students reported using this tool primarily for work, while 60% used it for research purposes.

Thirdly, there were the benefits of Zotero; the most valued was automatic citation formatting, which 70% of the students found beneficial (Table 3). This tool helped

reduce the time and energy spent on citation conventions, particularly when conducting academic research that requires specific citation formats, such as APA, MLA, or Chicago. Moreover, 60% appreciated the ability to automatically extract data from websites, rather than manually typing it. 50% of students reported reference management as helpful for arranging and extracting data needed for future studies. However, only 10% used Zotero's note-taking and tagging document function.

Table 3. Benefits of Zotero

Zotero Benefits	Percentage (%)
Automatic citation formatting	70
Automatic data extraction from websites	60
Reference management	50
Note-taking and tagging documents	10

Regarding effectiveness (Table 4), 50% of students indicated that using Zotero helped them increase the efficiency of learning and studying to a slight extent, while 30% reported a significant improvement.

Table 4. Improvement in Efficiency

Level of Improvement	Percentage (%)
Slight improvement	50
Significant improvement	30

Table 5. Challenges in using Zotero

Challenges	Percentage (%)
Installation and integration	60
Data extraction	40
Document search	50
Citation creation	40

However, the study showed several remarkable challenges (Table 5). The most significant struggle was installing and integrating the tool, which accounted for 60% of the issues, particularly due to compatibility issues with certain academic databases, such as Google Scholar and JSTOR. Furthermore, 50% of students experienced difficulties with document search, and 40% reported problems with finding and extracting data, as Zotero cannot automatically identify information from online sources or PDF files. Additionally, 40% of students reported that citing creation was challenging for them.

Finally, regarding students' expectations and desired features for Zotero, almost all students (80%) said that

Zotero met their needs and didn't add new features (Table 6). However, 10% of students suggested that Zotero should improve its compatibility with the running organisation, and 10% wanted to increase its user-friendliness.

Table 6. Desired features for Zotero

Desired Features	Percentage (%)
No additional features needed	80
Enhanced compatibility	10
Improved usability	10

5. DISCUSSION

The study aims to evaluate graduate students' perceptions of Zotero and their use of this tool in storing and citing academic documents.

The study's results indicated that Zotero offers numerous essential benefits for academics, particularly in a research context within the English Linguistics Master's course. However, the level of applying this tool in practice, particularly in studies of students, is limited and uneven. Although graduate-level students recognize that Zotero is an effective software for creating citations and managing references [15]. Its use in academic research is not widespread. This finding is consistent with previous studies, which show that Zotero enhances the quality of citations and reference management; however, students often lack the knowledge and skills to fully utilize these features [16].

The frequency and time spent using Zotero are relatively low, reflecting the trend that students primarily use this tool when needed rather than as a long-term supporting tool throughout their research [17], and that data management tools are not often adopted thoroughly.

Additionally, difficulties with technology contribute to Zotero's decreasing effectiveness. According to [2, 17], graduate-level students struggle with the process of installation, database integration, data extraction, and modification of citation formats. In particular, new users find it more challenging to adapt to the strict requirements for standard citations. Despite Zotero's friendliness, the lack of detailed instructions is the primary reason students use only basic functions and avoid advanced features.

However, the benefits of Zotero are clear. Functions such as automatic citations, reference management, and data extraction from websites greatly assist students by

saving time, streamlining the citing process, and enhancing the consistency and clarity of academic research. These findings show that Zotero is not only a document storage tool but also plays a significant role in enhancing working proficiency through optimizing the organisation and analysis processes of research documents [1].

Overall, the discussion reveals a notable gap between Zotero's technical potential and its actual deployment in academic research among graduate students. Although Zotero enhances research effectiveness and citation quality, its primary focus is on the systematic application and comprehensive technical support in educational training courses. When these conditions are met, Zotero can become a sustainable and effective tool supporting much of the research of English Linguistics graduate students.

6. CONCLUSION

In this study, postgraduate students in English linguistics investigated the use of Zotero as a reference management tool, learning its advantages and disadvantages. The results indicate that although Zotero provides substantial benefits in citation automation and reference organization, its use could be more consistent if awareness and familiarity were greater. Zotero's citation automation and formatting features are much valued for improving academic research productivity and minimizing citation errors. However, technological limitations in utilizing the software, especially in exploring academic databases and creating citations, pose hurdles for many students.

The study emphasizes the need for enhanced technical support and better instruction on Zotero's advanced features to maximize its utilization. Increased familiarity with Zotero among students and better integration with academic resources, such as Google Scholar and JSTOR, will be essential to fully realizing the tool's potential in educational research.

In conclusion, while Zotero is a valuable tool for improving the accuracy and efficiency of research processes, addressing its limitations through targeted improvements and student training will enhance its effectiveness. These insights contribute to a broader understanding of reference management technologies in academic research, with implications for future research and pedagogical practices aimed at fostering better research outcomes.

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