ICT Skill in Administration: Employing Electronic Achieve Application in Archive practice Course Higher Education

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Abstract. Today’s young generation is used to learning with integrated technology (ICT). Technology-based learning (ICT) is essential in supporting the preparation of prospective pre-service teacher to be creative and innovative according to future needs. Through this paper, we investigate how the impact of using the E Archive application is supported by a simulation of a contextual approach to archiving skills. The researcher adopted an experimental research method with two groups (experimental; control) with a posttest; to determine the impact of the proposed contextual approach using the E Archive application on archiving skills. The sample in this study consisted of 86 pre-service teacher students, divided into two experimental and control groups. The intervention is carried out in simulations using ICT applications, which have a more beneficial impact on improving student skills than conventional approaches. Data was collected through pretest and posttest, which were analyzed and processed statistically. The results of parametric statistical analysis show that students in the experimental class have superior skills compared to controls. They are more familiar with and actively involved in archival simulations and perform better using ICT with contextualized simulations. Suggestions for improving skills should be made by considering technological developments and selecting the right approach.

Keywords: ICT; E – Archive Applications; Contextual Approach; Archive Skills.

INTRODUCTION

Integrated learning with technology in higher education has become a basic need and challenge. Information and Communication Technology (ICT) is crucial to change the educational learning process. The acceleration of the adoption and development of information technology places ICT in a vital position in the learning process. Pre-service teacher are faced with the critical fact that they should be able to adapt quickly by creating innovative learning. Innovative learning can be done by collaborating on various learning components, such as using...
appropriate learning approaches and media.

Even though technology has provided opportunities in the learning process to produce better technological skills, we still need to see a gap in information and communication technology-based learning in the learning process in Indonesia. This gap arises from various factors, including limited infrastructure, lack of expertise at the regional level, educational gaps, and teacher competency (Hermawan et al., 2018). Even though there is tremendous potential for teachers and students to harness the power of ICT to improve the quality of teaching and learning (Lawrence & Tar, 2018). (Novita, 2022) states that the Indonesian Education Personnel Education Institute has graduated many pre-service teachers but with varying qualities caused by several contextual factors such as policy, socioeconomic, education system, and geographical challenges. Institutional differences lead to quality differences. Various tertiary institutions are expected to be able to improve the quality of the learning process along with increasingly dynamic changes in technology and science. Quality teaching and learning is one of the essential educational goals for educational institutions. The use of information and communication technology has become a major driving force in transforming education. The role of information communication technology is becoming increasingly important in addressing increasingly complex competency requirements.

(Asad et al., 2020) stated that integrating information technology and communication refers to various electronic equipment, especially computers, to create, store, analyze and send information. (Bai et al., 2016) found that integrating ICT into classroom teaching can effectively increase student test scores compared to schools that use little or no technology at all. (Champa et al., 2019) found that the readiness of Indonesian teachers to integrate ICT was found to be relatively low, which means that teachers still need to maximize the integration of ICT in Indonesia.

At this time, pre-service teachers should be able to use innovative approaches to develop the required information and communication technology skills amidst the limitations of information and communication technology infrastructure (Oborah, 2022). This is done to overcome gaps in the mastery of information and communication technology skills in the learning process at school.

Office administration economics education is a major that teaches various teacher skills with content or competencies in the field of office administration. Graduates from this major are prepared to be able to teach at vocational schools in the field of business management, especially in office administration vocational competencies or what is known as office management and business services (according to the latest curriculum). One of the required courses taught to pre-service is in the form of archiving practice courses. Pre-service teachers should master this subject because it is one of the main competencies to be taught to students in vocational schools. The content of this course places more emphasis on skills in carrying out practical filing procedures, which are even a competency test requirement for students at vocational schools in order to obtain a competency certificate in the field of office administration which is recognized in Indonesia which is tested by NPCB (National Professional Certification Board).

Along with developing science and technology, Indonesia has changed the education curriculum, which is currently known as the "independence curriculum." This curriculum change has changed the content taught in the Vocational School, specifically in the competence of expertise in office administration. Almost all contents require the integration of technology, including in archiving practices, which have now turned into elements of "digital-based documents." Of course, this change should be caught by higher education institutions to prepare pre-service who can adapt and master technology that continues to occur and is dynamic.

Findings by (Enrique Hinostroza, 2018) show that in developing countries, many students and teachers need the digital skills needed to use learning support tools effectively, thereby limiting their potential impact and will further increase educational disparities even though the availability of sophisticated learning technology will undoubtedly provide more significant opportunities in order to support learning practices in technology-based vocational schools (Yasak & Alias, 2015).

The characteristics of archival learning are carried out in a simulated or practice-based way. The practice includes three main activities, namely processing documents, storing documents, and retrieving documents. Learning is carried out practically to involve students in direct practical experience in archiving activities.
Competencies that should be achieved by students, in general, can do procedural document processing, procedural document storage, and procedural retrieval of documents based on five archive storage systems which generally include number, alphabet, subject, area, and date. All filing practice activities should be carried out procedurally. All activities procedurally arranged have been designed as closely as possible to those carried out by various agencies or offices in general so that students can provide meaningful lessons when teaching at school.

We also consider the various problems that occur with teachers in office administration. (Muhyadi et al., 2018) found that by using the curriculum that was in effect at that time, teachers in Vocational High Schools with Office Administration competencies needed to improve their skills in developing and using instructional media, practicing learning strategies, developing learning materials, classroom action research, evaluation of learning outcomes, and learning theory. (Mahdum et al., 2019) found that educators in Indonesia have a good perception and motivation towards integrating ICT into learning activities. However, educators still need help with various problems related to facilities and technical expertise. Preparing professional teachers has become a high priority in any country because this profession is considered a challenge and essential for the development and progress of the nation (Muhyadi et al., 2018).

The Urgency of Archiving Skills based on Technology Integration (ICT) for pre-service of Administration. Curriculum changes in Indonesia, such as the currently valid independent curriculum, have impacted the learning content at the Vocational School level, such as the competence in office administration. Technology integration is dominant and should be carried out according to the objectives or learning outcomes set. Office administration or office service management and business services (the newest term) is a part of the vocational school. Technological advances and dynamic changes in the labor market have significantly impacted vocational schools in improving the quality of the learning process. (Sylte, 2020) reveals that the level of relevance of competence and the needs of the labor market is a challenge faced by Vocational School today and in the future. (Ali et al., 2020) found that the gap between vocational graduates and expectations for the world of work is partly because learning at vocational schools is often only carried out with simulations due to limited tools, while teachers are only able to provide practice using old material even though it is no longer relevant, with the development of science and technology. The research results align with the findings of (Rizwan et al., 2021), showing a significant gap between the level of perceptions of employers and the competence of Vocational School graduates. One form of technology integration in the learning process can be using technology-based learning media (Susantini et al., 2021)

(Nyfantoro et al., 2019) stated that most institutions in Indonesia used electronic-based filing applications, both government and private institutions, even in the fields of banking and education. The technology base, such as software, varies, such as computer-based, Android-based, and website applications. The government has also supported electronic archive management with the issuance of Law of the Republic of Indonesia No. 11 of 2008 concerning information and electronic transactions. Electronic archives are explained as archives with a new format whose management uses computer technology. Even in its implementation, the management of electronic records is also a supporter of the implementation of e-government, namely the transition of government services with citizens from manual to electronic, relying on technology, communication, and information as intermediaries. E-government is carried out to improve public services to citizens so that the services provided by the government will be of higher quality (Harisanty & Anugrah, 2021). Therefore, it is vital to provide provisions to pre-service in the field of office administration in vocational schools regarding learning archiving practices.

Electronic archives and Applications E–Archives. (Read & Ginn, 2015) state that electronic archives can contain quantitative data, text, images, or audio originating from electronic signals. (Pramono, 2021) defines electronic records as records that are created, used, and maintained as evidence, proof of transactions, evidence of an activity or activities, and evidence of the functions of institutions or individuals that are transmitted and processed by a computer system. (Sutirman, 2020) defines electronic archives as created, received, stored, and accessed using electronic technology. (Aris, 2021) mentions electronic archives as digital archives made in electronic form or physical....
archives, which are converted into electronic archives for later use electronically.

The development of computer technology has made it possible to store a complete document or even only specific data by considering the needs and the computer used (Rosalin, 2017). In practice, electronic archive storage is different from conventional archives. The most noticeable difference is that electronic archives do not require ample space as conventional archives are stored in a cupboard and require a large amount of space.

(Saeroji, 2014) states that Microsoft Access is a supporting program that can design databases needed in filing systems, such as control cards, incoming and outgoing agenda books, archival borrowing books, and expedition books. The most important thing is that Microsoft Access can be used as an archive storage database. One of the advantages of compiling a Microsoft Access-based archival application is a compiled database that can be adapted to learning electronic archives in the world of education by adjusting the competency needs of archival subjects (Kuswantoro, 2015).

Therefore, we conduct research by integrating ICT into the E-Archive application developed from Microsoft Access. The selection of Microsoft Access, which is part of Microsoft, is based on the availability of databases that can be developed according to needs, such as archival applications. The advantages of Microsoft Access according to (Rante, 2020) state that the advantages of Microsoft Access include 1) It is file-based, so it is more portable, 2) manipulation of tables and data is very easy to do, using Structured Query Language (SQL) so it is easier to make access, 3) change and manipulate relational data, and 4) support relational databases.

In addition to using appropriate media, learning should be supported by selecting the right approach. Archiving course learning so far seeks to provide hands-on practical experience with students being given problems and opportunities to solve archival problems by practicing directly. The Contextual Teaching and Learning (CTL) approach is an innovative learning approach that emphasizes contextual learning through complex activities. In archival practice learning, the Contextual Teaching and Learning (CTL) approach has the potential to make learning experiences more exciting and meaningful for students. This is because the Contextual Teaching and Learning (CTL) approach will help students to be able to relate archiving practices based on problems that exist in the real world in a learning process. The aim is to provide an authentic experience to students from various real archival problems to equip knowledge and skills.

Choosing the right learning approach will impact the ease of students understanding of the material presented. One approach that can be used in archiving practice is Contextual Teaching and Learning (CTL). The Contextual Teaching and Learning (CTL) approach is a way of learning by applying various knowledge and skills that are contextually the same as those that will be applied in the real world. In the context of this research, because the learning method is practice, the Contextual Teaching and Learning (CTL) approach with archived documents will be taught to students in the form of various documents that are around or owned by students. The practical method, in collaboration with the Contextual Teaching and Learning (CTL) approach, will produce learning experiences for students regarding how to process, store and retrieve archives. This experience will be an alternative way to be applied when students teach at Vocational Schools in the future.

METHOD

Design

The quasi-experimental research design was used because it provides detailed information about the impact of independent variables in the form of a contextual approach with E – Archive media on the dependent variable, archiving skills for prospective teacher students in the field of office administration.

Participants

This research involved 86 prospective office administration teacher students at the Faculty of Economics, Universitas Negeri Semarang. These students were randomly divided into two groups, with 45 experimental and 41 students in the control class. The academic content provided to both groups is identical. However, the experimental group studied using a contextual approach using E-Archive media, while the control group studied using a contextual approach based on traditional tools.

Instrument

This study aims to investigate the effect of a contextual approach with E-Archive media
on improving the filing skills of prospective office administration teacher students at the Faculty of Economics, Universitas Negeri Semarang. Toward this end, an instrument for assessing student archiving skills was designed to assess the effect of a contextual approach with E-Archive media on the development of student archiving skills among college students. This instrument was developed and adapted from the National Professional Certification Board in Indonesia. The assessment instrument consists of three main activities in archival activities: preparation, process, and implementation.

The instrument's suitability was then verified by expert judgment, whose validity was calculated based on Aiken's V, and obtained a score of 1 or > 0.8 so that it can be said that the test item instrument has high validity. Therefore, the test item instrument can be stated as a valid instrument and suitable for use based on the five expert judgments without any improvement. After testing the content validity with the results declared valid and feasible, the instrument will be used as a data collection tool in this study. Furthermore, the instrument was tested on five students to see the reliability quality of the statistical calculation instrument showing a Cronbach alpha score of 0.76, indicating acceptable consistency of reliability.

**Process of the Experiment**

Experiments are carefully planned and orchestrated to ensure smooth implementation. The content taught to both groups was carried out within the same timeframe, namely one week, with each meeting being held for 150 minutes. The learning steps follow the syntax of the contextual approach. Measuring tools or research instruments which are used to measure skills are identical. The classrooms of both research groups are in the same place on the floor of the same laboratory with the same equipment, materials, and other characteristics such as lighting, ventilation, and seating. One week which is carried out in four meetings is carried out by repeatedly practicing according to the five different filing systems. The implementation of learning is also carried out in the same way, namely covering the implementation of learning carried out concerning the seven steps of effective learning in the contextual learning and teaching (CTL) approach, including 1) constructivism (Constructivism) builds students' knowledge through experience, 2) finding (Inquiry) attempts to finding knowledge and skills not from remembering a set of facts, 3) asking (Questioning) builds student curiosity by presenting real-life problems, 4) creating a learning community (Learning Community) provides opportunities for all students to be involved in the learning process. 4) modeling (Modeling) as a container for learning models that can be used as a forum for developing student learning processes by taking into account the needs of students and utilizing various available resources accordingly to help overcome the limitations of educators. 5) Reflection provides opportunities for students to provide feedback, and 6) Authentic Assessment conducts assessments to obtain information on the learning process with a particular approach through learning outcomes.

Instructors always start learning by presenting various archival phenomena that exist contextually. Then proceed with giving time to interact with each other to present a model (modeling). At this modeling stage, the instructor demonstrates or practices archival activity procedures according to each system being taught. Each meeting uses a different system except for the alphabetical and regional systems, which are carried out at the same meeting, while the number, chronology, and problem systems are carried out precisely one day for one topic of discussion. Furthermore, students practice with materials in the form of documents, usually in the company. Then students carry out three main activities in the form of scheduling, storage, and retrieval processes. This activity continues to be carried out repeatedly using practical methods, and this is done to provide real experience and skills for prospective teacher students even though they have never known archival activities before. Learning always ends with student reflections during learning by giving student reflection sheets the freedom to write down their performance at each meeting.

**RESULTS AND DISCUSSION**

**Result**

This study aims to investigate how the use of the E-Archive Application with a contextual approach has influenced students' archiving practice skills. The practical implications of this research come from its use for instructors and prospective teacher students to improve integrated learning with ICT, which is included as one of the efforts for skills, especially
archiving practice. This research provides an opportunity for researchers to investigate how much the designed treatment contributes to the expected skills. We realize that ICT, combined with specific approaches, will produce a different impact.

Based of this study shows that initially, pre-service teacher in the field of office administration have the same skills. This is consistent with the characteristics of the experimental research that the two groups have the same initial characteristics that can be observed from the pre-test data. Seeing these results, we experimented with applying a contextual approach using the E-Archive application in the experimental class. This treatment will improve student archiving skills because it offers more student involvement in the learning process through direct practice. The test results for differences in pre-test scores for prospective teacher students are presented in the following table 1.

**Table 1.** Pre-test T-test

<table>
<thead>
<tr>
<th>Administration</th>
<th>N</th>
<th>Df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>45</td>
<td>84</td>
<td>.530</td>
<td>.913</td>
<td>11,542</td>
<td>No</td>
</tr>
<tr>
<td>Control</td>
<td>41</td>
<td>84</td>
<td>.526</td>
<td>.913</td>
<td>11,542</td>
<td>Significant differences</td>
</tr>
</tbody>
</table>

Table 1 shows that there were no significant differences in the initial abilities of both the experimental group and the control group. Assessment of student's skills in the pre-test showed significant results to see the characteristics of the two groups. Furthermore, the post-test skills assessment shows the results regarding the effect of applying a contextual approach to improving prospective teacher students' skills in the office administration field, as illustrated in table 2.

**Table 2.** Post-test T-test

<table>
<thead>
<tr>
<th>Administration</th>
<th>N</th>
<th>Df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>45</td>
<td>84</td>
<td>.000</td>
<td>.913</td>
<td>1,448</td>
<td>Significant differences</td>
</tr>
<tr>
<td>Control</td>
<td>41</td>
<td>84</td>
<td>.000</td>
<td>.913</td>
<td>1,434</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows that significant differences in learning in the experimental class were carried out with a contextual approach assisted by the E-Archive Application. Archiving practice learning assisted by the E-Archive Application will make it easier for students to carry out archiving activities, especially in scheduling letters or recording, which is carried out directly on the system together with archiving activities. This process is very different from the method of storing archives manually, where the agenda archives in the mail agenda book follow the incoming or outgoing mail archives; after scheduling, the archives should be stored manually. Using the E Application - Archives for retrieving letters through letter borrowing activities is also faster and more precise by simply entering the save code in the system so that all the information and archives you are looking for can be obtained quickly. Meanwhile, it differs from manual archives, which should first search the filing cabinet, considering the guide and the folder/folder code. The comparison between the learning process of archiving practices with manuals and assisted E-Archive Applications is very particular in the technical activities and equipment used.

**Discussion**

Practical learning in this study emphasizes student skills in solving the problems given. Following the approach used, the tools, materials, and work instructions are presented to resemble problems that exist in the real world. These problems are designed in demonstration learning followed by practice by each student. In
practice, students are positioned as archivists in a company whose job is to handle the records provided on the desk. Because the practice is carried out individually (non-group), all students independently are actively involved in learning and work independently to solve these problems. Thus each student will be tested for their skills to solve problems independently with the modelling given by the previous instructor.

Using the E-Archive application provides more benefits compared to the manual method. Using the E-Archive application makes it easier for students to schedule incoming letters by inputting in detail all the information contained in the letter. In addition, data or reports (recap) of all data are available in full according to each data input by students. Another important thing is that retrieving archives takes shorter than typing the archive code you are looking for. The E-Archive Application has been designed as an integrated system where both the scheduling, storage, and retrieval processes are carried out in one integrated system so that this application is more effectively used for students while doing practical’s compared to the manual method. The manual method has more steps that should be done by hand and stored in manual equipment. While using the E-Archive Application, after students have processed letters such as affixing exemptions, adding numbers, adding dates, filling in exemptions (for incoming letters), giving signatures (for outgoing letters), and providing letter codes, the next step is for students to do media transfer, namely by scanning or archival photos which are then inputted into the E – Archive Application. Even so, the limited availability of computers and scanning tools required students in the experimental class to use laptops and handphone cameras independently during the learning process. So archiving practice learning with contextual learning and teaching (CTL) is effective in improving student archiving skills significantly compared to archiving practice learning with manual (conventional) contextual learning and teaching (CTL). There are several reasons why the contextual learning and teaching (CTL) approach using the E-Archive Application is more effective than manually. These reasons include: 1) the process of scheduling or recording letter information is carried out simultaneously with the storage process through the same system, 2) the process of retrieving archives by entering a code takes less time than searching for archives manually, 3) students do not need to do leave the work desk while doing work, 4) the possibility of losing files in the system is very slight, 5) The results of work reports can be recorded automatically in the report recap section, 6) work is carried out in an integrated system that contains recording and storage, report recap replacing the agenda book as well as the retrieval of archives carried out in the system is different from the manual which uses an agenda book for archive search information, 7) Overall the time in working on students is shorter compared to the manual method.

The N-Gain test is carried out to determine the magnitude of the increase in the pre-test value before specific treatments are carried out and the post-test values after being given specific treatments. This test was carried out to see whether the use of the E-Archive application with a contextual approach was effective or not by looking at the increase in grades obtained by students. The mean increase between the pre-test and post-test scores of the control class and class experimentally can be obtained by the gain n test. Before carrying out the treatment, Both classes were given pre-test questions to reveal knowledge early to students through the material they wanted to learn. N – Gain result see on table 3.

<table>
<thead>
<tr>
<th>Administration</th>
<th>Mean Score</th>
<th>N Gain</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Test</td>
<td>Post Test</td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>68.64</td>
<td>89.44</td>
<td>0.6679</td>
</tr>
<tr>
<td>Control</td>
<td>67.73</td>
<td>77.90</td>
<td>0.2996</td>
</tr>
</tbody>
</table>

Table 3. N – Gain Score
Table 3 shows that the value of the N-Gain calculation has an average increase of the pre-test and post-test values in the experimental class, which is higher than the control class. The N – Gain score in the control class is 0.2996, which is included in the low category because <0.3. While the N – Gain score for the experimental class shows 0.6679, which is in the medium criteria because it is 0.3 <0.6679 <0.7. Thus, concerning the N - Gain value, it shows an increase in students' skills which is higher in the experimental class than in the control class. This can be seen from the value of the N – Gain category in the experimental class with the medium category and the control class in the low category.

This finding is consistent with the research (Areej Khuder Hassan, 2023) that specific learning models will have an impact on increasing student achievement (Zhao et al., 2022) found that learning designs that can build students' abilities to study independently and practice techniques and facilitate development will result in students gaining superior skills. Integration technology has also been shown to increase student activity and involvement in learning, such as (Hammadi, 2022; Zhang et al., 2022) that learning using ICT is more effective for improving student skills.

CONCLUSIONS AND SUGGESTIONS

The aims of this study to investigate the impact of applying a contextual approach assisted by the E-Archive application on improving prospective teacher students' filing skills in the office administration field. In the end, we found that applying a contextual approach contributed to improving the archiving skills of prospective teacher students. This is understandable because the contextual approach is designed by presenting real archiving work in the real world in the classroom so that even though they have never experienced working as archivists in the real world, they have learned to be archivists while in college. Furthermore, ICT integration in the form of E-Archives to improve students' skills has proven effective in improving their performance during learning. Compared to the control class, superior performance gains were found in the experimental class. Technology's efficiency and convenience are fundamental reasons it performs better in terms.

Recommendation of this study students greatly influence the successful use of the E-Archive Application with a contextual approach. Therefore, students are expected to be actively involved during the learning process by carrying out practical activities following work instructions, evaluating and reflecting on work results, and improving to optimal results. Using E-Archive Applications with a contextual approach has proven effective in enhancing student skills, therefore, for lecturers to use the E-Archive Application media, which collaborated with various methods to facilitate the achievement of student competency standards.

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perception gap between employers and vocational students for career sustainability. *Sustainability*, 13(20), 11327.


