

TEACHER'S PERSPECTIVE ON THE USE OF ICT IN THE CLASSROOM: TEACHER ELEMENTARY SCHOOL CONTEXT

Indah Wahyu Permata¹, Pupun Purnawarman²

Universitas Pendidikan Indonesia^{1,2}

indahwahyupermata@upi.edu¹, purnawarman@upi.edu²

Article History

Received:
Oktober 30, 2023
Revised:
January 23, 2024
Accepted:
March 5, 2024
Published:
March 14, 2024

Abstract

This study investigates the perspectives and incentives of elementary school educators interested in integrating ICT-based learning resources into their teaching methods. The study followed a quantitative approach using surveys, interviews, and observations to gather data, using questionnaires and interviews as data collection tools. The results indicate that most teachers exhibit a positive attitude towards employing ICT in their teaching, with quantitative analysis often categorizing elementary school educators according to their use of learning media. However, the implementation of ICT-based resources is not without its challenges. In conclusion, this study underscores the need for pedagogical adjustments, emphasizing educators' need to continually enhance their ICT knowledge and teaching strategies through training, whether offered by educational institutions or external organizations. This will enable teachers to adapt and refine their teaching methods effectively.

Keywords: *ICT-Based Learning, Teacher Readiness, Information and Communication Technology (ICT)*

Introduction

Education in the 21st century plays a pivotal role in equipping the Indonesian population with the ongoing integration of information and communication technology into everyday social interactions. The concept of 21st-century learning is a direct consequence of the evolving dynamics within society. In this modern era of education, it is imperative for both educators and students to possess digital literacy and technological proficiency, enabling them to effectively employ ICT applications and methodologies as integral tools for teaching and learning (Hafifah et al, 2020). Thus, schools must be able to prepare or introduce technology-based education to their

students. School programs must focus more on helping students learn effectively, especially in cognitive, emotional, and motor skills. Assisting students in achieving their goals is the best approach to teaching. Learning media facilitates and enhances learning. Using modern technology to help in teaching and learning better in the 21st century. It is supported by Trilling and Fadel., 2009) and Stauffer (2010) identified the top three abilities for the twenty-first century. They cover knowledge and creativity, information, media, technology, and life and work skills. This includes using e-learning, which is a way of using computers and other electronic devices to help us learn.

Teachers use learning media to help them understand concepts and ideas more clearly and motivate students to be more active and think critically. Students also find learning media useful for learning and doing things effectively. Teachers need to know about the students' difficulties and what they need help with, and learning media should be designed based on those needs. Numerous technological advancements and programs have been created to aid people in accomplishing tasks, such as learning in e-learning. A recent trend in Japanese education is to use ICT, which includes things like textbooks, modules, transparency OHP, slide PowerPoint, images/photographs, animations, movies/videos, television broadcasts, radio broadcasts, Hypertext, WEB pages, Web-Quest, programs for computer-assisted learning, Internet-based project work and software learning support applications. So, professional teachers should be able to pick the right technology and application to help them learn, and then use it to their advantage (Hidayah et al., 2020)

Technology is used in education at all levels, including higher, secondary and primary education. Students' ease of learning is the main goal of technology-based learning materials. ICT-based learning media enhances the learning experience by allowing students to engage with the material and each other anytime and anywhere. confirms that using ICT-based learning can help students' knowledge in primary school. ICT in education aids students to become more attentive, concentrated, and engaged, thus stimulating the learning process (Sahlin et al., 2017). According to a study (Nursanti & Hartoyo, 2015.) found that students who frequently utilize computers for self-study have a markedly positive effect, both directly and indirectly.

Efficient ICT-based learning educational resources have been created to improve student learning results.

Teachers must be skilled in using technology to create learning materials, but learning materials that use technology can be challenging to create effectively. ICT-based learning media can be helpful in this process, as it provides helpful tools for teachers. Teachers need to be comfortable using traditional methods of teaching. The incorporation and assimilation of ICT are essential in gaining access to knowledge and keeping up with current advances. The teacher has now figured out how to use technology effectively. Teachers of ICT theory understand the process of clear adoption of ICT, but they haven't yet put it into practice (Buabeng-Andoh, 2012). The difference between a theoretical comprehension of an idea and its successful application in real-world situations. Regarding ICT, educators may understand the value and advantages of using technology in their lessons, but they may find it difficult to do so successfully.

(Kim et al., 2019) in his research reported that some teachers still can't use the computer, but that doesn't mean they can't learn how to use it. When it comes to ICT skills, most high school students are way behind. That's especially true when it comes to computational thinking skills. Based on prior research on learning media development and challenges, This study aims to explore elementary school teachers' perceptions regarding using Information and Communication Technology (ICT) in their teaching and learning activities. Additionally, it seeks to understand how these educators integrate ICT-based learning resources into their instructional practices. Specifically, this research focuses on elementary school teachers' attitudes and practices concerning ICT utilization in the context of teaching and learning.

As defined by Smaldino et al. (2014: 7) cited in Yusrizal et al. (2019), media encompasses everything that conveys information from its source to the intended recipients. According to Schramm (1907: 4), media is a technological means of conveying information, which can also serve educational purposes. Media is a conduit for transferring information from one location to another. Its role extends to various communication processes, including teaching and learning activities. Hence, the

objective of ICT-based learning media is to utilize technology to transmit knowledge from an educator (the source of information) to students (the recipients) to accomplish educational goals.

I Wayan Santyasa (2007:3) states five components related to communication in the learning process. Communication between teachers and learning materials, between students and learning media, between learning objectives and students, and between teachers and learning objectives are five steps in the learning process. So, everything that can be used to attract students' attention, interest, thoughts, and feelings in learning activities to achieve learning goals is a form of learning media. The teaching and learning process cannot be carried out without learning media. At least one media must be selected and used in every teaching and learning process to transmit knowledge.

Rusman et al. (2015: 181) categorized media into three distinct groups: 1) Audio media, which comprises content that is exclusively auditory; 2) Visual media, encompassing media that solely consists of visual elements without any auditory components; and 3) Audio-visual media, a category of media that integrates both sound and visual elements. According to (Santyasa, 2007), Judging from its form, learning media can be grouped into Visual media, which refers to items that can be viewed or read, such as images, photos, graphs, diagrams, charts, posters, cartoons, books, and so on. According to Ritonga (2017) cited in (Yusrizal et al., 2019) Information and communication technology (ICT)-based learning media include the Internet, PowerPoint, e-learning, e-mail, and learning CDs. Furthermore, Rosdiana (2016) classifies ICT-based learning media into three categories: 1) Computer technology, 2) multimedia technology, and 3) computers and technological advances. According to Rusman et al. (2015), ICT-based learning media include 1) computer-based learning, 2) TV/video-based learning, 3) blended learning, 4) e-learning, 5) powerpoint-based learning, and 6) computer network-based learning.

Moreover, Kemp dan Dayton" (1985: 28) cited in Syafei et al., (2020) argued the function of learning media is 3 if the media is used in individuals, groups, or groups

of listeners who have a large number, namely; motivating interests and actions, presenting information, and providing instructions.

Learning media is information that can be used to help you learn. It can be in the form of knowledge, which you can use to learn more about something, or it can be a tool you can use to engage in activities such as reading, observing, attempting, posing questions, and responding to queries, which can facilitate learning. Educational media is closely associated with learning materials, which can aid in maximizing the effectiveness and efficiency of the learning process.

In terms of its appearance, learning resources can be divided into two categories: learning resources that were specifically designed to help you learn, and resources that can be used for learning, no matter what the format. Examples of the first type of learning resources include books, encyclopedias, dictionaries, and learning materials in multimedia (films, videos, animations, slides, computer-aided learning software), and online learning sites. Examples of the second type of learning resources include the natural environment, physical surroundings, social environment, and human life. Because media and learning resources are so closely related, it can be difficult to tell the difference between them, but they can be clearly distinguished as follows: learning resources are physical objects that can be used to help you learn, while media is the physical means used to convey learning material. For example, a CD is a learning resource, but if the CD contains a collection of articles or learning software that students can use, then the CD is a learning media.

Method

This research used a quantitative approach using surveys to investigate how elementary school teachers in Kijang, Kepulauan Riau, utilize technology for teaching purposes. Surveys were used to discern the primary research objectives, as per the classification by Babbie (2004), which includes describing phenomena, providing explanations, and exploring them. The primary focus of this study was on describing the phenomena observed.

The research was conducted in Kijang and involved 15 participants, all of whom were elementary school teachers. The researchers employed a simple random

sampling method to select the participants. Data was collected through surveys, observations, questionnaires, and interviews.

The data for this research were collected on January 17, 2023, using a combination of questionnaire and interview methods. The questionnaire, designed to elicit written responses, followed specific guidelines. It included nine closed-ended questions, categorized into four sections: Teachers' Perceptions Regarding ICT-based Learning (five questions), Types of Learning Media Used (two questions), Students' Motivation and Engagement with Media (two questions), Frequency of Teacher's Use of Learning Media (measured through polling). The questionnaire utilized the Likert scale as a measurement instrument. This scale required respondents to indicate their degree of agreement or disagreement with a series of statements, using categories like strongly agree (SA), agree (A), undecided (U), disagree (D), or strongly disagree (SD). However, this study adapted the Likert scale into four categories: SA, A, D, and SD. Each response was assigned a point value, and an individual's score was calculated by summing all statements' point values.

Additionally, the Likert scale was applied to gauge the frequency of teachers' use of learning media, with response options including "always," "often," "sometimes," and "never." This polling method helped assess the general practices of elementary school teachers in using learning media.

The subsequent phase involved interviews with the teachers as part of the data collection process. As described by (Gay et al., (2009) an interview is a purposeful interaction in which one individual seeks information from another. Genesee, as cited in Haris (2007), pointed out that conducting interviews allows researchers to gather supplementary information from respondents in response to noteworthy or unexpected insights that may arise from pre-planned questions. The interviews were carried out to capture the participants' verbal responses comprehensively. Before the interviews, the teachers had already completed the questionnaires. The purpose of these interviews was to obtain spoken feedback from the participants. In this study, the interviews were instrumental in cross-verifying the data to ensure the accuracy of

the information gathered during the observations. Subsequently, the researcher proceeded to analyze the collected data.

Results

The quantitative analyses, derived from closed-ended questions and focus group discussions, unveiled four key themes about the utilization of ICT-based learning media in elementary schools: 1) Usage of Learning Media: This theme focuses on how teachers in elementary school settings employ learning media. 2) Teachers' Perceptions of ICT-Based Learning: This theme explores the attitudes and opinions of teachers towards ICT-based learning. 3) Types of Learning Media Employed by Teachers: This theme delves into the various types of learning media teachers utilise in their educational practices. 4) Student Motivation and Interest in the Media: This theme centers on the impact of learning media on students' motivation and their level of interest. The data for this study were collected through surveys, polls, and interviews with the participants.

1. The Use of Learning Media

According to the findings of a survey on media usage in primary schools, teachers utilize learning media regardless of whether they are already using ICT-based learning resources.

Table 1. Use of Learning Media

Educators employ Learning Media		
	n	%
Always	2	13.3%
Often	5	33.3%
Sometimes	6	40%
never	2	13.3%
	15	100

The effective utilization of ICT to enhance the learning process demands proficiency and expertise in using these technologies. Therefore, it is crucial to assess the teachers' capabilities in operating ICT tools, which include smartphones,

computers, and laptops. The survey results from teachers indicated that 40% of them make use of ICT-based learning resources.

To gauge teachers' perceptions of ICT-based learning media, two critical factors should be considered: perceived usability and ease of use. For more detailed information on how instructors see the use of ICT-based media, please refer to the table 2.

2. Teachers' perceptions towards ICT-based learning

Table. 2 Teachers' opinions about learning based on ICT

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree
a. ICT can improve the efficiency of the learning process	7	8	0	0
a. ICT can create various learning activities	6	8	0	1
b. ICT has given benefits to me as a teacher	7	8	0	0
c. ICT helps me perform better as a teacher	6	9	0	0
d. ICT helps kids develop good learning attitudes	2	11	2	0

The data presented in Table 2 suggest that the teachers' responses reflect a readiness and willingness to embrace information and communication technology as a learning medium in the school environment. However, it's worth noting that, based on the responses obtained from the questionnaires administered to the teachers, there was one individual who expressed a contrary view, suggesting that ICT-based learning media might not be notably appealing or effective for the learning process.

3. Types of learning Media used

Indeed, as described by Sahid (2007) there are two types of learning media: Media Specifically Designed for Learning: This category includes learning materials intentionally created for educational purposes. Media Not Specifically Designed for

Learning: Here, media resources that were not initially developed for educational use can still be harnessed as effective learning tools.

Table 3. Types of learning Media used

	Strongly agree	Agree	Neither agree nor disagree	Disagree
a. Media that was in school	1	11	2	1
b. Media created by teachers	4	8	3	1

The data provided suggests that a significant number of teachers exhibit a preference for utilizing pre-existing media resources rather than developing their own. This inclination is evident in the teachers' willingness to employ media available within the school, as opposed to creating their instructional materials.

4. Motivation and Media Interest of Students

It is widely believed that the utilization of learning media can significantly impact student attention and interest in the educational process.

Table 4. Motivation and Media Interest of Students

	Strongly agree	Agree	Neither agree nor disagree	Disagree
a. ICT can enhance the enjoyment of learning activities	7	8	0	0
b. ICT can increase students' motivation	6	9	0	0

According to the table above, 7 of 15 teachers strongly believe that ICT can make learning activities more entertaining, while the rest agree. Regarding whether ICT may improve student motivation, 9 of 15 teachers agree ICT can influence students' motivation. Teachers' attitudes towards ICT refer to whether teachers' perceptions of using ICT in the teaching and learning are beneficial or disturbing.

The data demonstrate teachers' awareness and confidence that ICT will benefit this learning. This good perception and belief is believed to positively affect teachers' attitudes on the usage of ICT in the classroom. According to the interview, teachers use almost any sort of media, whether conventional or ICT-based learning media, because they can use ICT confidently. It is also supported by a study done by (Schiller, 2003) who discovered that a person's computer expertise and views about computers can influence the usage of technology in the classroom.

Discussion

The primary aim of this research is to assess the preparedness of elementary school teachers for the implementation of ICT-based learning. To determine this readiness, the study employs several indicators, including questioning teachers about their readiness to use ICT-based learning media. Additionally, the research seeks to gauge teachers' perceptions regarding ICT-based learning, ascertain the types of learning media they use, and evaluate student motivation and interest in media utilized for computer-based learning as a supplementary tool in the educational process.

1. The Use of Learning Media

Based on interviews conducted with the teachers, it was found that all teachers emphasized the significance of learning media. It is supported by one of the participants who said that VB *"teachers frequently use learning media daily, believing that learning is less effective without it"*. On the other hand, the SFR teacher stated that *"I occasionally use learning media, especially when the material is challenging for students"*. This suggests that the teacher recognizes the importance of learning media in facilitating education, but in practice, the utilization of media is not fully optimized.

Moreover, some teachers still lack a positive perception of the importance of media in the learning process.

This conclusion is similar to (Rozie et al., 2018) who found in his research that the data analysis indicates that many teachers in Bangkalan lack an understanding of using media as a learning tool to facilitate the achievement of learning objectives. They do not perceive media as something essential for reaching their educational goals. As a result, teachers rarely use learning media, primarily because they are still in the process of selecting and adapting learning materials or creating simple media, which can be time-consuming. However, it's important to note that learning media plays a crucial role in supporting the learning process, even though the number of available media resources in elementary schools is limited.

2. Teachers' perceptions towards ICT-based learning

Table 2 showed that teachers are highly aware of the role of ICT in learning. As seen in the table, most teachers believe that incorporating ICT-based learning is crucial. In the words of Mr. AT, "*ICT makes it easier to provide teaching materials to students.*" Other teachers agreed, saying, "*The availability of ICT allows students to actively develop their knowledge.*" ICT has created a plethora of chances to improve education. Teaching and learning can take place at any time and in any place, especially in the classroom (Cradler, 2002).

This favorable perception does not correspond to reality. Teachers look for ways to avoid using ICT for the best learning. According to the interviews, the majority of teachers continue to use books as a learning medium. Mrs. WF went on to say, "*Since each student possesses a physical textbook, making books the most convenient and practical medium for learning*". There are a few teachers who never utilize power points for two reasons: they do not know how to operate a computer and there is no projector in the classroom. Almost all teachers employ graphics, video, and audio at some point. Ms. VAS went on to say: "*The utilization of visual media, videos, and audio serves to tailor the content to be taught, enhancing its accessibility and effectiveness*". The implementation of multimedia and e-learning is suboptimal due to a lack of competence in mastering these technologies and the absence of suitable

<https://doi.org/10.35905/inspiring.v7i1.7096>

facilities. Furthermore, constraints related to ICT infrastructure, such as limited internet access, hinder the full exploitation of ICT in teaching and learning, which aligns with the findings of Mahdum et al. (2019).

As noted by (Ndlovu & Moll, (2016) teachers encounter difficulties when integrating ICT into their lesson plans because of both technical know-how and facility constraints. It is emphasized that teachers should possess the capability to effectively use ICT and integrate it into the learning process. Those who can successfully integrate ICT into their teaching methods can create a more classroom with an enhanced learning environment, and social media is increasingly employed to augment learning activities, as mentioned by (Blair et al., n.d.)

3. Types of learning Media used

Regarding the types of learning media that are used in the teaching and learning process, the teachers tend to use existing media rather than their own, as one of the teachers said:

"...Using the media that is already available is more practical..."

"... making the learning media takes a lot of time while we have other jobs..."

Educators should harness their creativity to incorporate engaging learning media into the teaching and learning process. Learning media is expected to aid instructors in the effective delivery of subject matter. The role of multimedia learning is closely intertwined with the teaching methods and the learning tools used. The choice of a specific teaching method influences the types of learning media employed, The usage of media will draw students' attention to their studies, which frequently results in boredom although various other factors must also be considered, such as the teacher's expertise, the nature of the task, student responses post-learning, the learning context, and student characteristics (Billasari, 2020)

Nevertheless, it can be affirmed that one of the primary functions of instructional media is to serve as a learning tool that influences the overall

atmosphere, conditions, and learning environments shaped and cultivated by the teacher (Sujadi et al., 2015).

(Wasilah, 2012) emphasized the importance of using precise and engaging learning media. Media in education can make the learning process more effective, creative, and enjoyable for students. When learning lacks the use of media, students tend to become less focused when educators explain the material, as supported by the study of (Elpira et al., 2015). It is also supported by Rusman, et al (2015) who classified the type of media as audio-visual media, a category of media that integrates both sound and visual elements for using the media to make the learning process more effective.

(Fitriyah et al., 2020) researched learning media development, reinforcing the idea that a creative teacher who can use engaging learning tools is essential. Learning media is intended to assist instructors in effectively delivering subject matter. Consequently, a teacher must possess the minimum necessary skills, proficiency, and expertise to meet specific criteria and competencies.

To achieve the best learning outcomes, it is crucial to properly design learning objectives, methods, teaching materials, and the selection of relevant media, while ensuring that teachers have the necessary skills.

4. Students ' Motivation and Interest in the Media

Teachers play a crucial role in enhancing students' learning motivation as they have extensive interaction with students during their time at school. Teachers can foster improved motivation in students by developing learning strategies that serve as external motivators for learning. These strategies encompass the methods and media utilized in the learning process. This is in line with a study done by (Areski et al., 2019) Both teachers and students can benefit from the research's findings. Teachers must provide students with techniques or strategies before instruction so that they can more easily explain their ideas and become more engaged in the learning process.

The data indicate that teachers are aware of the benefits that ICT can bring to education, and this positive perception is believed to positively influence their attitudes towards integrating ICT into their teaching practices. Teachers, as revealed in <https://doi.org/10.35905/inspiring.v7i1.7096>

interviews, employ various types of media, both traditional and ICT-based, with confidence. This is in line with (Schiller, 2003) findings, which suggest that an individual's computer proficiency and views about technology can impact its usage in the classroom. A study (Puspitarini & Hanif, 2019) also demonstrates that students exhibit greater interest in learning when using media other than textbooks, as supported by the interview results.

Therefore, an alternative approach to boost students' learning motivation is required. One such option involves leveraging technology as a medium for learning. Traditional lecture methods may not captivate students, leading to reduced comprehension and motivation. Students become more engaged when interacting with peers, exercising creativity, and actively participating in the learning process. Relying solely on textbooks can result in boredom and hinder students' ability to absorb the material effectively.

Conclusion

Based on the results of this study, teachers generally hold a positive view of integrating ICT into their teaching practices. Nevertheless, There are difficulties in implementing ICT-based learning resources. It is essential for teachers to continuously enhance their skills and broaden their understanding of ICT utilization through training, which educational institutions or other organizations can offer. This ongoing professional development enables teachers to effectively adapt and refine their teaching methods and strategies. The outcomes of this display are anticipated to enhance literature reviews in teaching using ICT-based media. Also, this information holds significance for education policymakers and teacher trainers, school administrators, teacher educators, and interested parties, particularly in shaping teacher education for the 21st century. This understanding can, in turn, guide initiatives to revise teacher education curricula. The study not only enlightens the use of ICT in teaching but also shows that ICT allows for flexible and adaptable teaching approaches, accommodating different learning styles. These needs and highlight areas require improvement.

References

- Areski, W. P., Muhammadun, M., & Selle, A. (2019). *Using Expression Card Media To Improve The Students Speaking Skill At The Second Great Of Sma Negeri 1 Parepare* (Vol. 2).
- Billasari. (2020). *Increasing Students' Speaking Ability By Using Magic Disc* (Vol. 3).
- Blair, R., Millard, D., & Woollard, J. (N.D.). *Perceptions Of School Children Of Using Social Media For Learning*.
- Buabeng-Andoh, C. (2012). Factors Influencing Teachers' Adoption And Integration Of Information And Communication Technology Into Teaching: A Review Of The Literature. In *International Journal Of Education And Development Using Information And Communication Technology (IJEDICT)* (Vol. 8).
- Elpira, N., Ghufro, A., Pendidikan, D., Riau, K. P., & Yogyakarta, U. N. (2015). Pengaruh Penggunaan Media Powerpoint Terhadap Minat Dan Hasil Belajar Ipa Siswa Kelas Iv Sd. *Jurnal Inovasi Teknologi Pendidikan*, 2(1), 94–104.
- Fitriyah, L. A., Hayati, N., & Wijayadi, A. W. (2020). The Content Knowledge Ability Of Science Teacher Candidates: The Analysis Of Learning Media Development. *Jurnal Pena Sains*, 2(2). <https://doi.org/10.1921107/Jps.V7i2.7995>
- Gay, L. R., Mills, G. E., Airasian, P., Columbus, B., New, I., San, Y., Upper, F., River, S., Cape, A., Dubai, T., Madrid, L., Munich, M., Montreal, P., Delhi, T., São, M. C., Sydney, P., Kong, H., Singapore, S., & Tokyo, T. (N.D.). *Educational Research Competencies For Analysis And Applications Tenth Edition*.
- Hidayah, R., Ngatman, Susiani, T. S., Salimi, M., & Suhartono. (2020). How Elementary School Teachers Use Ict-Based Learning Media? *Journal Of Physics: Conference Series*, 1511(1). <https://doi.org/10.1088/1742-6596/1511/1/012015>
- Jurusan, S., Matematika, P., & Uny, F. (N.D.). *Pengembangan Media Pembelajaran Berbasis ICT*.
- Kim, H. S., Ahn, S. H., & Kim, C. M. (2019). A New ICT Literacy Test For Elementary And Middle School Students In Republic Of Korea. *Asia-Pacific Education Researcher*, 28(3), 203–212. <https://doi.org/10.1007/S40299-018-0428-8>
- <https://doi.org/10.35905/inspiring.v7i1.7096>

- Ndlovu, N. S., & Moll, I. (2016). Teachers, Technology, and Types Of Media: Teaching With Icts In South Africa.
- Nur Hafifah, G., & Harry Sulisty, G. (N.D.). *Teachers' Ict Literacy And Ict Integration In Elt In The Indonesian Higher Education Setting*. [Http://Www.Mendeley.Com/Docu-](http://www.mendeley.com/docu-)
- Nursanti, R., & Hartoyo, A. (N.D.). *Pengembangan Media Pembelajaran Berbasis Ict Untuk Meningkatkan Kemampuan Representasi Matematis Siswa Dalam Materi Spldv*.
- Puspitarini, Y. D., & Hanif, M. (2019). Using Learning Media To Increase Learning Motivation In Elementary School. *Anatolian Journal Of Education*, 4(2), 53–60. [Https://Doi.Org/10.29333/Aje.2019.426a](https://doi.org/10.29333/Aje.2019.426a).
- Rahmaniati, R. (2015). Keterampilan Calon Guru Sd Dalam Menerapkan Media Pembelajaran IPA Berbasis IT Terhadap Hasil Belajar Siswa SDN–5 Panarung Palangka Raya. *Anterior Jurnal*, 15(1), 62-69.
- Rozie, F., Guru, P., & Dasar, S. (N.D.). *Persepsi Guru Sekolah Dasar Tentang Penggunaan Media Pembelajaran Sebagai Alat Bantu Pencapaian Tujuan Pembelajaran*.
- Rusman, D. Kurniawan, C. Riyana. 2015. Pembelajaran Berbasis Teknologi Informasi Dan Komunikasi. Mengembangkan Profesionalitas Guru. Jakarta: Rajawali Pers.
- Sahlin, J. S., Tsertsidis, A., & Islam, M. S. (2017). Usages And Impacts Of The Integration Of Information And Communication Technologies (Icts) In Elementary Classrooms: Case Study Of Swedish Municipality Schools. *Interactive Learning Environments*, 25(5), 561–579. [Https://Doi.Org/10.1080/10494820.2016.1170045](https://doi.org/10.1080/10494820.2016.1170045).
- Schiller, J. (2003). Working With ICT: Perceptions Of Australian Principals. *Journal Of Educational Administration*, 41(2), 171–185. [Https://Doi.Org/10.1108/09578230310464675](https://doi.org/10.1108/09578230310464675).
- Syafe'i, I. (2020). Implementasi Media Bahasa Dalam Pembelajaran Mahārat Al-Kalām Berdasarkan Fungsi Media Pembelajaran Menurut Kemp Dan Dayton. *Tsaqofiya: Jurnal Pendidikan Bahasa Dan Sastra Arab*, 2(2), 44-59.

- Sujadi, I., Retno Sari, D. S., & Magister Pendidikan Matematika, P. (2015). *Pengembangan Media Pembelajaran Matematika Berbantuan Komputer Dengan Lectora Authoring Tools Pada Materi Bangun Ruang Sisi Datar Kelas Viii Smp/Mts. 3(2)*, 167–178. [Http://Jurnal.Fkip.Uns.Ac.Id](http://Jurnal.Fkip.Uns.Ac.Id)
- Trilling, B., & Fadel, C. (2009). 21st-Century Skills: Learning For Life In Our Times. John Wiley & Sons.
- Wasilah. (2012). JPPII 1 (1) (2012) 82-90. *Jurnal Pendidikan IPA Indonesia*0, 1((1)), 82–90.
- Yusrizal, Y., Hajar, I., & Tanjung, S. (2019). Analysis Of Elementary School Teachers' Ability In Using ICT Media And Its Impact On The Interest To Learn Of Students In Banda Aceh. *Budapest International Research And Critics In Linguistics And Education (Birle) Journal*, 2(3), 37–49. <https://doi.org/10.33258/Birle.V2i3.352>
- Santyasa, I. W. (2007). *Landasan Konseptual Media Pembelajaran. Makalah Disajikan Dalam Workshop Media Pembelajaran Bagi Guru-Guru SMA Negeri Banjar Angkan Klungkung, Bali 10 Januari 2007* (Doctoral Dissertation, Tesis. UNP. Padang).