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*Review Article*

# Effectiveness of Using AI Perplexity in Designing Science Learning Materials

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**Abstract:** The rapid development of Artificial Intelligence (AI) has opened new opportunities for teachers in designing instructional materials. This study aims to describe the effectiveness of using Perplexity AI in designing Natural and Social Science Knowledge (IPAS) materials in elementary schools. Using a quantitative descriptive approach, data was collected through questionnaires from three elementary school teachers as a preliminary study (pilot study). The indicators measured included ease of use, time efficiency, material quality, and usefulness. The research results indicate that Perplexity AI is highly effective, with an overall average score of 4.29, falling into the "Good" category. These findings demonstrate that Perplexity AI significantly supports teachers in organizing systematic lesson plans and improving teaching material preparation. This research provides a foundation for the broader implementation of AI tools in the education sector, suggesting that AI can be an effective aid in the development of educational content, ultimately enhancing the teaching and learning experience in schools.

**Keywords:** Artificial Intelligence; Effectiveness; Instructional Materials; Perplexity AI; Teaching Material Preparation

## 1. Introduction

Development rapid digital technology has bring change significant in the world of education, including at the tertiary level school basic. One of the form innovation technology that is starting utilized in field education is Artificial Intelligence (AI). AI is technology that is capable help increase effectiveness of the learning process as well as support teachers in design and develop material more learning relevant and appropriate with need participant (Abidin et al., 2023). Utilization of AI in education allows teachers to access information in a way fast, arrange material learning in a way systematic, as well as increase efficiency in planning learning.

In learning science and science (Science Natural and Social Sciences) in schools basically, teachers are required for serve material that is contextual, easy understood, and capable linking draft learning with life daily students. Meaningful learning need teacher readiness in designing appropriate material with characteristics participant educate. However, in In practice, teachers often experience constraint in the form of limitations time in prepare material learning, difficulties look for appropriate references, as well as limitations variation presentation material. Condition the influential to quality science learning and can cause the learning process less than optimal (Batubara, 2023). Therefore that, teachers need support technology that can assist the design process material learning in a way more efficient and structured.

One of AI technology is starting to utilized in the world of education is AI Perplexity, which is a platform based on intelligence artificial that can help users in search, summarize, and compile information in a way fast and structured. AI technology of this kind This potential used by teachers as tool help in designing material learning, including in compilation summary material, search relevant references, and development of learning ideas. The use of

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AI as a supporters learning assessed capable increase efficiency teacher work and quality the resulting teaching materials (Abidin et al., 2023). In context science learning, AI Perplexity can help teachers present more material systematic and contextual in accordance with need participant educate school base.

Although thus, the use of AI in context education base Still need study more further, especially related with effectiveness its use by teachers in designing material learning. Research that is special study the use of certain AI platforms, such as Perplexity AI, in science learning in schools base Still limited. Therefore research this aim for describe effectiveness the use of AI Perplexity in designing material science learning in schools base based on teacher experience as subject research. Research results This expected can give description about to what extent Perplexity AI helps teachers in increase efficiency, convenience, and quality design material science learning (Batubara, 2023).

## 2. Literature Review

### Perplexity AI

Development very rapid digital technology has bring change significant in the world of education, including at the tertiary level school basic. One of the innovation technology that is starting utilized is Artificial Intelligence (AI), namely technology that is capable help increase effectiveness of the learning process as well as support teachers in design and develop material more learning relevant as well as in accordance with need participant educated (Abidin et al., 2023). In the context of Here, Perplexity AI is here as a platform based intelligence helpful artificial users in search, summarize, and compile information in a way fast and structured. Utilization of AI in education allows teachers to access information in a way instant, composing material learning in a way systematic, as well as increase efficiency in planning learning. Perplexity AI has potential big as tool help teachers in designing materials, including compilation summary, search relevant references, up to development of innovative learning ideas.

The use of AI platforms such as Perplexity is considered capable increase efficiency teacher work and quality teaching materials produced in a way significant (Abidin et al., 2023). In general technically, this platform offer convenience use with average value of 4.33, which indicates that teachers can operate it without need skills complicated technicalities. Ease of use factor this is very crucial in adoption technology education, because easy tool operated will more fast accepted and utilized by teachers in activity learning everyday life (Sugiyono, 2019). In addition, the effectiveness of Perplexity AI is also seen from aspect efficiency time with score 4.22, which helps teachers in save time moment look for references and compiling framework material (Abidin et al., 2023). Although own ability tall in produce content, the presence of AI remains positioned as digital assistant that supports teacher professionalism and not as replacement role main educator in the learning process (Abidin et al., 2023).

### Learning in Elementary Schools

Learning Knowledge Natural and Social Sciences (IPAS) at the level school base is integration eye lessons that combine science and social concepts for give complete understanding to participant educate about phenomenon nature and dynamics society. In the implementation curriculum moment in this case, teachers are required for own ability in serve natural sciences material contextual, easy understood, and capable linking draft learning in a way direct with experience life daily students. Essence from meaningful learning is very dependent on the readiness and competence of teachers in designing material that is not only accurate in a way scientific, but also adaptive to characteristics unique as well as need participant educated at school basic. This is in line with view that use digital technology plays a role crucial in help teachers present material more learning quality, systematic, and relevant with characteristics participant educated at the level basis (Batubara, 2023).

However, in reality practice in the field, implementation Science learning often faces quite a challenge significant. Teachers often experience constraint real in the form of limitations time in prepare material diverse learning, difficulties in look for appropriate references with level cognitive students, as well as limitations variation in presentation teaching materials (Batubara, 2023). Conditions limitations the in a way direct influential to decline quality science learning and can causing the process of knowledge transfer become less than optimal for students (Batubara, 2023). Therefore that, is necessary existence support innovation technology, such as intelligence artificial, which is capable assist teachers in compile framework material in a way more efficient, structured, and organized. Utilization digital technology and AI in education base expected can become solution strategic for

teachers to overcome obstacle administrative as well as increase efficiency time, so that quality design material science learning can Keep going improved in order to achieve objective maximum learning (Abidin et al., 2023).

**Effectiveness Using AI Preplexity in Design Science Learning**

Effectiveness use technology in context education can measured through how far the tool the capable support teachers in reach objective instructional in a way efficient, accurate, and high quality. In design science learning at the elementary level school fundamentally, the use of Perplexity AI shows level very significant effectiveness with acquisition overall average score reached 4.29, which placed it in "Good" category (Abidin et al., 2023). Effectiveness This reflected from platform capabilities in help teachers organize material in a way systematic, so that preparation teach become Far more structured, in-depth, and comprehensive. Utilization technology intelligence this artificial (AI) proven in a way empirical capable increase efficiency teacher work in total, especially at stages crucial like planning materials and development teaching modules that have been This often become burden obstacle administrative for power educators (Abidin et al., 2023, pp. 1–12).

In a way more specific, effectiveness the use of Perplexity AI in designing IPAS material is supported by several indicator superiority main thing that is felt directly by the user. First, the aspect convenience ease of use score 4.33, where the teacher assessed that this platform is very intuitive and easy operated without demand skills technical complex programming. This is speed up the adoption process technology in the environment school (Sugiyono, 2019). Second, efficiency time (score 4.22) to factor key because of this platform in a way automatic save teacher's time in do research accurate references, compiling summary materials, as well as exploring innovative learning ideas for students (Abidin et al., 2023). Third, the quality of the material produced (score 4.33) was assessed Far more systematic and relevant with objective science curriculum. Fourth, the aspect usefulness (score 4.33) shows that Perplexity AI is very helpful for teachers in enrich reference scientific and composing framework more material contextual with life real student school base.

In a way Overall, the integration of Perplexity AI in design science learning in action as solution technology innovative and capable increase professionalism as well as quality instructional skills of teachers in the digital era (Abidin et al., 2023). The use of this digital assistant give superiority competitive for teachers to produce varied and non-unique teaching materials boring. Although thus, the effectiveness technology This still very dependent on the role active teachers in selecting, validating, and contextualize every information generated by AI to remain in harmony with need unique as well as development cognitive every participant educate in class (Abidin et al., 2023). With thus, harmony between intelligence artificial and teacher pedagogy becomes key main in create optimal science learning.

## 3. Research Method

**Types and Approaches Study**

Study This use approach quantitative with type study descriptive research quantitative descriptive aim for describe or describe something phenomenon in a way objective based on the numerical data obtained from respondents, without do testing hypothesis and analyze connection cause and effect between variables (Sugiyono, 2019).

Approach quantitative descriptive in study This used for get description about level effectiveness the use of AI Perplexity in designing material science learning in schools base based on teacher perception as respondents research. The data obtained served in form numbers, then analyzed and interpreted for explain conditions under study in a way systematic.

Study this no intended for produce conclusions that are generalization to larger population wide, but rather for give description empirical about effectiveness the use of AI Perplexity in context science learning at school basic. This is in line with characteristics study descriptive that focuses on exposure facts and conditions current in accordance with data obtained in the field (Arikunto, 2018).

**Subject Study**

Subject in study This is three school teachers the basis that has experience using AI Perplexity in designing material Science learning. Selection subject study done use convenience sampling technique, namely technique taking sample based on convenience researchers in reach appropriate respondents with criteria research (Sugiyono, 2019).

Convenience sampling technique was chosen Because study This nature descriptive and purposeful for get description beginning about teachers' experiences and perceptions of the

use of AI Perplexity in learning, not for do generalization results research. In addition, the technique This assessed in accordance for study scale small that emphasizes depth information in context certain (Creswell, 2016).

**Instrument Study**

Instruments used in study This is questionnaire closed shaped choice double with category answer graded (Likert scale). Each grains statement accompanied by five alternatives. The answers are Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), and Strongly Agree (5). The Likert scale is used. For measure attitudes, opinions, and perceptions respondents to something object or phenomenon in a way quantitative (Sugiyono, 2019).

Questionnaire arranged based on indicator effectiveness the use of AI Perplexity in designing material science learning, which includes:

a. convenience use,
b. efficiency time,
c. quality material learning,
d. usefulness in learning, and
e. effectiveness use in a way overall.

Every statement in questionnaire designed in a way clear and simple for easy understood by respondents, so that the answer given can reflect experience and perception respondents in a way objective (Arikunto, 2018).

**Data Collection Technique**

Data collection was carried out with method spread questionnaire to respondents through online media using Google Forms. Before filling questionnaire, researcher moreover formerly explain objective study as well as give instruction filling to respondents. Respondents Then requested for fill in questionnaire in accordance with experience and views they in using AI Perplexity to designing material science learning.

Use questionnaire as technique selected data collection Because assessed effective for obtain data in amount limited in a way efficient as well as allows respondents for give answer in a way independent without pressure from researcher (Sugiyono, 2019).

**Data Analysis Techniques**

Data that has been collected analyzed use statistics descriptive. Data analysis techniques include calculation frequency answers, percentages, and average (mean) values for each indicator research. Scores from every statements on the questionnaire Likert scale summed Then counted the average value for determine category level effectiveness Perplexity AI usage.

The results of the data analysis are presented in form tables and descriptions descriptive for give clear picture about level effectiveness the use of AI Perplexity in designing material science learning in schools basic. Statistics descriptive used for presenting what data existence in accordance with condition respondents without do inference statistics (Sugiyono, 2019).

**Research Ethics**

Study This notice principles ethics research. Participation respondents in study nature voluntary without existence coercion. Identity respondents guarded confidentiality, and all data obtained used solely for interest study academic. Researchers also ensured that the data collected No misused as well as served in a way objective in accordance with results obtained in the field (Arikunto, 2018).

## 4. Results and Discussion

**Research Result**

Study This aim for describe effectiveness the use of AI Perplexity in designing material science learning in schools base based on Teacher perception. Research data obtained through questionnaire Likert scale filled in by three school teachers the basis that has experience in integrating AI Perplexity into in design material science learning. Use questionnaire with this Likert scale aim for measure perception, attitude, and assessment respondents to effectiveness the use of AI Perplexity in quantitative (Sugiyono, 2019).

Data obtained analyzed use technique statistics descriptive with count average value (mean) for each indicator research. Statistics descriptive used for describe data conditions in general objective in accordance with reality on the ground without intend to do generalization or testing hypothesis (Arikunto, 2018). Results of the analysis average effectiveness value the use of AI Perplexity in designing material science learning is presented in a way detailed in Table 1 below:

**Table 1.** Results of the Analysis of Average Questionnaire Scores Effectiveness Perplexity AI Usage

| No | Indicator | Average Score | Category |
|---|---|---|---|
| 1. | Convenience use | 4.33 | Good |
| 2. | Efficiency time | 4.22 | Good |
| 3. | Quality material learning | 4.33 | Good |
| 4. | Usefulness use | 4.33 | Good |
| 5. | Effectiveness use in a way overall | 4.29 | Good |

Based on the data in Table 1, it can be seen that that all over indicator effectiveness Perplexity AI usage is in the range score "Good" category. Indicator convenience usage, quality material, and the benefits each obtains score highest of 4.33. This is represent that the Perplexity AI platform does not only easy operated by teachers, but also provides impact real positive to quality teaching materials produced.

Indicator efficiency time get score of 4.22, which indicates that the use of AI in significant capable cut time teacher's work in stage preparation teaching. In a way accumulative, effectiveness use in a way overall reach score of 4.29. This result confirm that AI Perplexity is considered very effective by teachers in assist the design process material science learning at the elementary level school basic. Use this digital assistant proven become solution innovative in overcome various obstacle traditional which is often faced by teachers, such as limitations references and complexity compilation systematic material (Abidin et al., 2023).

Success This show that when AI technology is designed with friendly interface user - friendly, then level adoption technology among educator will increased (Sugiyono, 2019). In the context of IPAS, Perplexity AI's ability to presenting data in a fast and structured really helps teachers in align material with demanding curriculum presentation contextual and relevant content with life daily participant educate.

**Discussion**

Research result show that the use of AI Perplexity in designing material science learning obtains Very positive ratings throughout indicators studied. Findings This indicates that utilization technology Artificial Intelligence (AI) can give contribution real to improvement effectiveness teacher's work in planning learning, especially in subjects science lessons at school demanding basis depth material and contextuality. Based on research data, there are a number of points important things to analyze more deep about Perplexity AI effectiveness:

First, on the indicator convenience use, obtained average value of 4.33 with category good. High score This show that teachers feel the Perplexity AI platform has intuitive interface so that No need skills technical or Language complicated programming. Ease accessibility is factor determinant main in adoption technology education; when an easy platform operated, the teacher will more tend accept and integrate it to in routine Work daily they for support the instructional process (Sugiyono, 2019). This prove that AI Perplexity is successful bridge gap between technology sophisticated and capable digital literacy of school teachers base.

Second, the indicator efficiency time get average value of 4.22 with category good. This result in a way empirical prove that AI Perplexity plays a role as accelerator that helps teachers save time in do research reference, compile summary solid material, up to exploring innovative science learning ideas. Findings This strengthen the theory put forward by Abidin et al., (2023) that utilization intelligence artificial in the world of education capable optimize efficiency teacher work, especially in the phase crucial namely design and development teaching materials that often take up Lots time in a way administrative.

Third, on the indicators quality material learning, obtained average value of 4.33 with category good. The teachers give evaluation that framework designed materials with Perplexity AI assistance tends to more structured, systematic, and highly relevant with objective learning science curriculum. This in harmony with Batubara's view (2023, pp. 45–52) which emphasizes that integration the right digital technology can help educator serve content distance learning more quality, attractive, and appropriate with characteristics cognitive participant educated at the level school basic. Quality accurate information from AI allows teachers to presenting scientific and social data in a way more valid.

Fourth, indicators usefulness usage also reaches score 4.33 with category good. Teachers view AI Perplexity not just trend technology, but rather tool help functional in enrich reference scientific and easy compilation framework material (mini syllabus). Usefulness This emphasize AI's position as a "digital assistant" that supports teacher professionalism, however

No Once intended for replace role pedagogical, empathy, and control instructional skills possessed by teachers (Abidin et al., 2023). Permanent teachers hold control full in verify truth information generated by AI systems.

Lastly, the indicator effectiveness use in a way overall with score 4.29 confirms that AI Perplexity is credible solutions in support teachers in designing science material. Although study This own coverage limited subject, analysis deep to practitioners' responses give description real (rich insight) regarding potential big AI in schools basic. The use of AI remains need teacher skills in selecting, adapting, and contextualizing material to remain in harmony with need specific and environmental social culture students (Arikunto, 2018). With Thus, the effectiveness of AI Perplexity lies in collaboration. between intelligence machine in processing data and intelligence man in process values education.

## 5. Conclusions

Based on results data analysis and discussion that has been done, can concluded that the use of AI Perplexity has level high effectiveness with average score of 4.29 (Good category) in his role as digital assistant for teachers designing material science learning in schools basis. Effectiveness This proven through consistency mark high throughout indicator, start from convenience facilitating use adoption technology in a way fast, until usefulness real in enrich reference material science and social for student.

Superiority AI Perplexity's main advantage lies in its ability in provide access instant, accurate, and organized information, as well as produce quality systematic content in accordance with objective curriculum. In general practical, technology This give implications big as solution innovative for teachers to overcome various obstacle administrative, in particular in cut time preparation teaching and composing more material varied as well as contextual. Although thus, the use of AI remains positioned as instrument supporters in need literacy and control pedagogical from the teacher so that the material produced still in harmony with characteristics development cognitive students.

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