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How One Thinks While Trying To Solve A Mathematical Problem Blended Learning From The Perspective Of One's Personality Type

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Abstract

The purpose of this research is to determine the level of competency that students have in the ability to solve mathematical problems within the context of blended learning, as well as to investigate the method in which students participate in problem-solving activities in relation to the unique attributes that make up each student's personality. In the current investigation, we make use of a design called contemporaneous triangulation, and we incorporate a number of different methods of research. According to the findings, learning is effectively applied when the criteria for achieving the Minimum Completion Criteria as well as classical completeness are achieved. This was found to be the case. Students with the personality types ESTJ and INTJ are more likely to engage in a cognitive process that requires thorough examination for the purpose of improving comprehension and establishing opinions that are accurate, consistent, and intuitive. This is because these students are more likely to value accuracy, consistency, and intuition in their judgments. Cognitive processes that include the generation of precise and coherent information, views, and judgments are typically utilized by individuals with the personality types ESTP (Extrovert Sensing intellectual Perceiving), ESFJ (Extrovert Sensing Feeling Judging), and ESFP (Extrovert Sensing Feeling Perceiving). These three personality types are commonly referred to as "extroverts." As a result of the cognitive processes that they engage in, people who have the personality type known as Extrovert Intuition Feeling Judging (ENFJ) have a propensity to arrive at accurate understandings, ideas, and conclusions; nevertheless, these tend to be inconsistent with one another. People who have the ISTJ personality type, also known as the Introvert Sensing Cognitive Judger, are known to regularly and accurately engage in the cognitive process of generating knowledge and opinions. On the other hand, it is important to keep in mind that they might not always arrive at appropriate conclusions through the process of drawing them. The personality types known as ISTP (Introvert Sensing Thinking Perceiving) and ISFJ (Introvert Sensing Feeling Judging) have historically shown a preference for making use of the thinking process not necessarily for the purpose of arriving at findings that are objectively correct, but rather for the purpose of developing internally coherent and accurate understandings and viewpoints. This preference has been demonstrated throughout history.

Introduction

Within the context of integrated learning, the purpose of this investigation is to determine the level of proficiency that students have in the ability to solve mathematical problems. In addition, an investigation will be carried out to investigate the extent to which the unique personality characteristics of individual pupils are correlated with the manner in which they approach the process of problem-solving tasks. The current investigation makes use of a methodological strategy known as contemporaneous triangulation, which integrates a number of different kinds of research strategies. According to the findings, the application of knowledge is at its most effective when it satisfies both the classical completeness and the Minimum Completion Criteria at the same time. The following is how the issue developed from there on out. People who self-identify as ESTJ or INTJ are more likely to demonstrate a higher propensity for participating in a cognitive process that requires in-depth analysis in order to better knowledge and create accurate, rational, and intuitive judgments. This tendency is seen most often in individuals who exhibit a higher tendency to describe themselves as ESTJ or INTJ. This occurrence can be explained by the fact that these students have a tendency to place a higher priority on making assessments that are correct, consistent, and intuitive to a greater extent. The cognitive processes that are displayed by individuals with the ESTP (Extrovert Sensing intellectual Perceiving) personality type, the ESFJ (Extrovert Sensing Feeling Judging) personality type, and the ESFP (Extrovert Sensing Feeling Perceiving) personality type are distinguished by their capacity to generate information, viewpoints, and evaluations that are accurate and consistent with one another. Within the realm of academic writing, "extroverts" most commonly refer to those who exhibit the aforementioned three traits. People who have the personality type known as Extrovert Intuition Feeling Judging (ENFJ) are more likely to arrive at accurate understandings, ideas, and conclusions as a result of the cognitive processes they engage in. However, it is not uncommon for these cognitive outputs to display internal contradictions. ISTJs, also known as Introverts who are Sensing Cognitive Judgers, are noted for their consistent and exact participation in the cognitive process of knowledge and perspective production. ISTJs are characterized as Introverts who are Sensing Cognitive Judgers. However, it is essential to keep in mind that kids may not always arrive at precise conclusions when they are sketching. This is something that should be kept in mind at all times. Both the ISFJ (Introvert Sensing Feeling Judging) and ISTP (Introvert Sensing Thinking Perceiving) personality types have traditionally exhibited a tendency toward the utilization of the thinking process to construct internally consistent and precise comprehensions and viewpoints, rather than solely aiming to reach objectively accurate conclusions. The ISFJ stands for Introvert Sensing Feeling Judging, and the ISTP stands for Introvert Sensing Thinking Perceiving. This preference has been displayed in a steady and reliable manner.

Method

According to Sugiyono (2016), it is essential to take steps in order to guarantee that the data collection process is exhaustive, genuine, trustworthy, and objective. A paradigm for doing research known as the concurrent triangulation design brings together qualitative and quantitative approaches to data collection. Both sets of data are collected at the same time under this methodology, then subjected to independent analysis before being compared to one another or combined. According to Creswell (2010), triangulation design is a research methodology that entails the acquisition of data that is both distinct and complimentary. The purpose of this methodology is to address research issues relating to a specific topic.

Since qualitative and quantitative data were gathered for the study, the researchers decided to use a methodology called contemporaneous triangulation that used mixed approaches. The method begins with the concurrent collecting of data, which is then followed by processing in order to develop solutions for several problem formulations included within a single study area. Analysis of quantitative information collected from test results is the method that is utilized in the process of determining how effective a candidate's problem-solving abilities are in the area of mathematics. The utilization of qualitative data gained from evaluation examinations and interviews serves the objective of illuminating the cognitive processes that are utilized by students in their efforts to problem-solve within the arena of mathematics. The purpose of this attempt is to provide insight into the mathematical education system. In the past, a questionnaire-based personality test was the method of choice for determining the students' personality types, which in turn influenced their strategies for approaching the solution of mathematical problems. The investigation consisted of a total of four unique stages, which were as follows: (1) the stage of planning, (2) the stage of implementation, (3) the stage of data analysis, and (4) the stage of conclusion.

During the planning phase, a variety of tools and resources are designed and arranged. Some examples of these include personality type evaluations using the Myers-Briggs Type Indicators (MBTI), interview guidelines, learning aids, and devices. The curriculum, a plan for the implementation of learning activities, student notebooks, and grids with mathematical problem-solving exercises are all included in the learning materials. Mathematical problem-solving examinations are used in the capacity of the evaluative tool. During the design phase, the procedure of selecting classes will take place so that they can act as the experimental group for evaluating the mathematical problem-solving examination issues.

A trial problem-solving test is given to the trial class in order to determine which test questions may be used for the actual implementation process. This step marks the beginning of the implementation phase. The researchers then moved on to the next step of the process, which was to use the Myers-Briggs Type Indicators (MBTI) questionnaire in order to categorize the different personality types of the people who were participating in the study. The delivery of education now encompasses both in-person and online experiences. Problem-Based Instruction (PBI), on the other hand, is utilized quite frequently in more conventional schooling environments, whereas Edmodo is most frequently utilized in online educational settings. Following the completion of the learning assessment, the participants were given a test, and individuals were selected for future interviews based on the personality types that they possessed according to the results of the test.

After the process of gathering data has been completed, the next phase entails undertaking data analysis in order to produce a response to the problem formulation that was previously defined. The results of the data analysis that was carried out should have logical inferences drawn from it.

Results

The results of the normality test show a significance level of 0.05, which indicates that the data was collected from populations that have a normal distribution. According to the findings of the minimal completeness requirements achievement tests, 75 out of the total 100 criteria have been satisfactorily met. The results of the assessment of classical completeness show that the value 1.86, which corresponds to the symbol, satisfies the classical completeness requirement of 75%. It is essential to present empirical evidence in order to give credence to the claim that practice-based education is effective.

When compared to the findings of other studies that have been undertaken on PBI learning, this one reveals some inconsistencies. According to the findings of the study (Arifin, Cartono, and Hidayah, 2018; Eko Setiyono Riau and Junaedi, 2016), problem-based education is advantageous and effective for aiding learning. This conclusion was reached based on the findings of the study. In addition, it has been noted that students who get problem-based education demonstrate stronger mathematical problem-solving skills compared to students who receive conventional instruction (Margana, 2016). This is the case when comparing students who receive problem-based instruction to students who receive conventional instruction. After the installation of Problem-Based Instruction (PBI), there has been a discernible improvement in the students' ability to solve a variety of mathematics problems.

An investigation that was carried out by the writers of the article named "Desi Setiyaningrum, Kartono, and Mulyono/Unnes Journal of Mathematics Education Research 9 (1) (2020): 26–40" and published in the Unnes Journal of Mathematics Education Research can be found at these page numbers: 26–40. When conducting analysis and interpretation, model your findings. 2012 was a leap year. (Yrizon and Sahyuni, 20XX).

The findings of this investigation are consistent with the findings of earlier research that used integrated learning to investigate different approaches to problem-solving. According to the findings of Riasari (2018)'s study, there is evidence that research is performed at a variety of educational levels. According to the results of the research, introducing blended learning, which places an emphasis on finding solutions to problems, can help improve students' ability to communicate mathematical concepts. Because of this enhancement, students are now able to effectively apply their mathematical knowledge and proficiency to the solving of issues, whether those problems are presented verbally or in written form. According to a number of studies conducted by Dianawati, Kartono, & Wardono (2018), Dziuban, Graham, Moskal, Norberg, & Sicilia (2018), Eryilmaz (2015), Hasjiandito, Haryono, & Djuniadi (2014), Lin, Tseng, & Chiang (2017), Mutaqin, Marethi, & Syamsuri (2016), and Sulistiyoningsih, Kartono, & Mulyono (2015), it has been found that students enrolled in blended learning classes exhibit superior performance compared to those in traditional classes. In addition to this, the studies underline the usefulness of blended learning approaches and show the major positive impact it has on the outcomes of students. In addition, according to Kintu, Zhu, and Kagambe (2017), the construction of an effective and unified learning environment is necessary for the successful incorporation of technology in the teaching and learning process.

In general, people who have the ESTJ personality type exhibit a tendency toward efficiently integrating and presenting their mathematical knowledge in order to successfully address a variety of problem-solving scenarios. This predisposition is one of the characteristics that distinguishes ESTJs from other personality types. It does not make any relation to the knowledge that has come before. In contrast, the learning of competency in mathematics is typically accomplished through the process of developing well-informed opinions while successfully solving mathematical problems. This can be accomplished by successfully solving mathematical problems utilizing strategies that produce accurate results, as well as by having the capacity to express and elaborate on the tactics that will be used. obtaining accurate solutions to mathematical puzzles by using the line of reasoning known as deductive reasoning. Two of the questions out of the three assess the degree to which students adhere to the established strategies for drawing inferences and confirming their responses. Students immediately begin reading after being given a question, and then they conduct a search to determine both the prior information they possess and the exact inquiry that is

being posed by the teacher. When students give in-depth responses to each question, it demonstrates a lack of effort to draw a connection between the questions and the information that was covered in a previous lesson or discussion.

Keirsey proposes that those who are classed as ESTJs fall under the category of having the Sensing-Judging (SJ) personality type. This personality type is also commonly referred to as the Guardian personality type. According to previous research on cognitive processes, the ESTJ personality type, also known as the guardian personality type, is adept at comprehending and documenting established knowledge and inquiries, formulating problem-solving approaches, and delivering precise yet occasionally inconsistent solutions in instances where incorrect responses were given. The findings of the current research are consistent with these earlier studies. The methodology section includes an in-depth explanation of each stage, and the findings are supported by the research carried out by Aziz, Kusmayadi, and Sujadi (2014), Putra (2017), and Sunarto, Budayadi, and Juniati (2014, 2017).

According to the findings of the investigation that was carried out by Putra (2017), it was discovered that the guardian or detecting personality type demonstrates a correlation between prior knowledge and known elements. According to Prasetya, Mulyono, and Rothmad (2018), students that exhibit cognitive field dependent styles may have challenges when it comes to planning and problem-solving. These findings are in direct contradiction to the initial discoveries reported by the researchers.

People who have the ESTP personality type typically have the capacity to effectively integrate and articulate their acquired knowledge, which in turn facilitates their competency in solving mathematics problems of an acceptable level of complexity. In general, this skill may be seen in persons who have the ESTP personality type. humans consistently engage in the cognitive process of producing ideas in order to effectively solve mathematical puzzles, as indicated by their capacity to explain and record the intended course of action and utilize tactics that provide the desired results. This demonstrates that humans consistently engage in the cognitive process of generating ideas in order to effectively solve mathematical problems.

Students consistently demonstrate their ability to draw conclusions by correctly solving mathematical problems, drawing inferences from the problems that they are given, and confirming the solutions that they have come up with. Students frequently go through a state of heightened anxiety and excitement when they are presented with a test question. This is caused by the students' desire to quickly determine the appropriate response to the question. Students who self-identify as ESTP typically dislike devoting an excessive amount of time to the task of reading questions and recording instructions. This is because ESTPs tend to be more intuitive and creative.

Conclusion

The significance level of 0.05, which was found in the results of the test for normality, suggests that the data was gathered from populations that have a normal distribution as their underlying pattern. The results of the minimal completeness requirements achievement tests indicate that 75 out of the total 100 criteria have been completed in a manner that is considered to be satisfactory. According to the findings of the evaluation of classical completeness, the number 1.86, which corresponds to the symbol, satisfies the condition of classical completeness with a score of 75% or above. In order to give weight to the argument that practice-based education is effective, it is vital to offer empirical data.

This one exhibits some contradictions when compared to the findings of other studies that have been carried out on PBI learning that have been carried out in the past. Problem-based education is favorable and helpful for assisting learning, as the findings of the study (Arifin, Carton, and Hidayah, 2018; Eko Setiyono Riau and Junaedi, 2016) indicate (Arifin, Carton, and Hidayah, 2018; Eko Setiyono Riau and Junaedi, 2016). The findings of the investigation led to this conclusion being drawn about the subject. In addition, it has been shown that students who receive instruction that is problem-based are able to solve mathematical problems more effectively than students who receive traditional training (Margana, 2016). When compared with kids who receive traditional education, students who participate in problem-based learning tend to have higher levels of academic achievement. There has been a demonstrable improvement in the students' ability to solve a variety of mathematical problems after the implementation of Problem-Based Instruction (PBI).

An investigation that was carried out by the authors of the article titled "Desi Setiyaningrum, Kartono, and Mulyono/Unnes Journal of Mathematics Education Research 9 (1) (2020): 26–40" and published in the Unnes Journal of Mathematics Education Research can be found at these page numbers: 26–40. The authors of the article are referred to as "Desi Setiyaningrum, Kartono, and Mulyono." Model your findings before moving on to the next steps of analysis and interpretation. It was a leap year in 2012. (Yrizon and Sahyuni, 20XX). Yrizon and Sahyuni.

The findings of this analysis are congruent with the findings of earlier research that employed integrated learning to investigate alternative approaches to problem-solving. This research was conducted by the same researchers who found that integrated learning is effective. The investigation that was carried out by Riasari (2018) came to the conclusion that there is proof that research is carried out at a number of different educational levels. According to the findings of the research, implementing blended learning, which places an emphasis on finding solutions to problems, can assist increase students' capacity to convey mathematical concepts. Blended learning places an emphasis on finding answers to problems. Students are now able to effectively apply their mathematical knowledge and proficiency to the solution of problems, regardless of whether the problems are presented in verbal or written form, as a result of this upgrade. According to a number of studies conducted by Dianawati, Kartono, & Wardono (2018), Dziuban, Graham, Moskal, Norberg, & Sicilia (2018), Eryilmaz (2015), Hasjiandito, Haryono, & Djuniadi (2014), Lin, Tseng, & Chiang (2017), Mutaqin, Marethi, & Syamsuri (2016), and Sulistiyoningsih, Kartono, & Mulyono (2015), it has been found that students enrolled in blended learning classes exhibit superior performance compared to those in traditional classes. In addition to this, the research highlight the effectiveness of blended learning approaches and indicate the large positive impact it has on the outcomes of students. This is shown by the studies. According to Kintu, Zhu, and Kagambe (2017), a successful use of technology in the teaching and learning process necessitates the building of an efficient and cohesive learning environment. This is a requirement for the implementation of technology.

In general, persons who have the personality type of ESTJ have a predisposition toward effectively integrating and presenting their mathematical knowledge in order to successfully address a variety of problem-solving scenarios. This tendency may be seen in these individuals. This inclination is one of the qualities that sets ESTJs apart from those of other personality types. Other personality types tend to be more... It is completely unrelated to the information that has been learned up until this point. In comparison, becoming proficient in mathematics is often achieved through the process of forming well-informed ideas while successfully solving mathematical problems. This

is in contrast to the traditional method of learning a subject. This can be accomplished by successfully resolving mathematical issues with procedures that provide accurate answers, as well as by having the capacity to articulate and expound on the ways that will be utilized. deductive reasoning refers to a method of thinking that allows one to obtain accurate answers to mathematical riddles by employing inductive reasoning. Two out of the three questions examine the degree to which students adhere to the known procedures for drawing inferences and validating their responses. The remaining question does not assess this. After being presented with a question, students instantly start reading, and then they perform a search to establish both the prior information they possess and the precise inquiry that is being addressed by the instructor. When students respond in great detail to each question, it suggests that they have not made an attempt to establish a connection between the knowledge that was covered in a previous discussion or lesson and the questions that are being asked in the current one.

According to Keirsey's theory, people who have the personality trait known as Sensing-Judging (SJ) can be classified as having the ESTJ personality type. This personality type is sometimes referred to as the Guardian personality type, which is

another common name for it. The ESTJ personality type, also known as the guardian personality type, is adept at comprehending and documenting established knowledge and inquiries, formulating problem-solving approaches, and delivering precise yet occasionally inconsistent solutions in situations where incorrect responses were given, according to previous research on cognitive processes. This personality type is also known as the protector personality type. The outcomes of this latest investigation are in line with the conclusions drawn from these earlier studies. The conclusions are corroborated by the research that was carried out by Aziz, Kusmayadi, and Sujadi (2014), Putra (2017), and Sunarto, Budayadi, and Juniati (2014, 2017). The methodology section offers an in-depth description of each stage.

As a result of the research that was carried out by Putra (2017), it was observed that the guardian or detecting personality type exhibits a correlation between prior knowledge and known elements. These findings were presented in the article that was published as a result of the inquiry that was carried out. According to Prasetya, Mulyono, and Rothmad (2018), students that exhibit cognitive field dependent styles may have difficulties when it comes to planning and problem-solving. These styles are characterized by a reliance on specific domains of knowledge. The researchers' initial discoveries stand in stark contrast to these new findings, which find themselves in direct opposition to those discoveries.

People who have the personality type of ESTP often have the capability to successfully integrate and explain their gained knowledge, which, in turn, facilitates their proficiency in solving mathematical problems of an acceptable level of complexity. People who have the ESTP personality type tend to be more adept in this skill than the average population. Humans consistently engage in the cognitive process of developing ideas in order to effectively solve mathematical problems, as demonstrated by their capacity to explain and record the intended course of action and apply techniques that deliver the desired results. This suggests that humans consistently engage in the cognitive process of producing ideas in order to effectively solve mathematical puzzles. This illustrates that in order for humans to effectively solve mathematical problems, they must continually engage in the cognitive process of developing ideas.

Students routinely demonstrate their capacity to draw conclusions by successfully resolving mathematical problems, deducing inferences from the difficulties that are presented to them, and

verifying the solutions that they have devised on their own. When students are given a question to answer on a test, they commonly experience feelings that are a combination of heightened anxiety and excitement. This is due to the fact that the pupils are eager to determine the acceptable response to the question as quickly as possible. Students who self-identify as ESTP often have a strong aversion to activities that need them to devote a significant amount of time, such as reading questions and recording instructions. This is due to the fact that ESTPs typically have a higher level of intuition and creativity.

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