

Technological Innovation in Exploring Self Esteem Models – Exseed Based on Education 5.0 for Special Smart Students.

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ABSTRACT

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To be successful in the future, special intelligent students not only need to optimize cognitive functions, but also a balance of character, including self-esteem. There are many cases found in the field of students with high intellectual capacity; apparently failed in various areas of life, including in the workforce.

This research aims to integrate technological innovation in the exploration of the self-esteem model based on education 5.0 or the Exploration of Self Esteem Model (Exseed) in order to strengthen the character of special intelligent students. Education 5.0 emphasizes the use of technology as a tool to enrich learning experiences. The education 5.0 approach allows the integration of technologies such as artificial intelligence (AI), Augmented Reality (AR), and Virtual Reality (VR) in learning. In this research, the application of technology is used as a tool to create and provide immersive learning experiences so as to help special intelligent students understand abstract concepts better so that they become concrete. The method used in this research is the waterfall method. The waterfall method has five process stages, including analyzing requirements, creating design, implementing, testing, and maintenance.

The results of this research are technology products in the Exploration of the Self Esteem Model Based on Education 5.0 with the name of the Exseed platform to Strengthen the Character of Special Intelligent Students. The practical implications of this research include the development of the Exseed learning platform that can be adapted to the individual needs of special intelligent students, as well as increasing learning engagement through the use of technology. The integration of technology in Exseed based on education 5.0 in exploring self-esteem in special intelligent students can be a step forward in strengthening character in an inclusive learning context that is centered on them.

Keywords: Technological Innovation, Education 5.0, Self Esteem Model, Exploration of Self Esteem Model (Exseed), Special Smart Students.

Introduction

Education is a conscious effort to prepare students through guidance, teaching and/or training activities for their roles in the future. (SNA, 2024). Education is a learning process obtained by every human being (student) to be able to make that human being (student) understand, be more mature and be able to make humans (students) more critical in thinking. (Zuković S, 2021)

Education is the main foundation in the formation of individual character, including for special intelligent students. (Sugiarti R E. E., 2022). Although great efforts have been made to improve learning and teaching methods for special intelligent students, there are still significant challenges in strengthening their character, especially in the aspect of self-esteem. (Verhoeven M, 2019).

Self-esteem is the view or value that a person subjectively gives to himself as a whole. This view is based on one's own beliefs and opinions, so it tends to be difficult to change. (van Dijk R, 2021). Self-esteem, or self-esteem, plays a very important role in the formation of a positive personality and independence in special intelligent students. (Martinez I, 2021). Specially intelligent students often face challenges in developing their self-esteem because they tend to feel isolated or unrecognized in conventional educational environments. (schnitker SA, 2021) Inappropriate support and lack of

recognition for their achievements can have a negative impact on the development of their self-esteem in the future. (Mustapha AM, 2023).

On the other hand, the era of education 5.0 promises great opportunities in introducing technological innovations that can change the educational paradigm. (Q., 2024). Education 5.0 emphasizes the use of technology as a means to increase the effectiveness, efficiency and inclusiveness of education. (Nkanu CU, 2024) By utilizing technology in the learning process, there is an opportunity to create a learning experience that is more interesting, relevant, and can be tailored to the individual needs of special intelligent students (3). Furthermore, there is still little research that specifically explores how technological innovation can be used to strengthen the character of (1) special intelligent students, especially in terms of increasing their self-esteem. Therefore, research that combines innovative concepts from technology-based education 5.0 is very necessary to strengthen the character of special intelligent students. (A, 2024)

In-depth research on technological innovation in the exploration of a self-esteem model based on education 5.0 to strengthen the character of special intelligent students can make a significant contribution to the literature and practice of inclusive education. (Hidayat H, 2024) This research uses the Exploration of Self Esteem Model (Exseed) platform to strengthen the character of special intelligent students. It is hoped that such research can provide new insights into how technology can be used effectively. (Yang F, 2024) to empower special intelligent students, increase their involvement in learning, and strengthen their self-esteem so that it further shapes their character when they enter the world of society. (Yang F, AI in language education: Enhancing learners' speaking awareness through AI-supported training, 2024). Based on the above background then:

1. How effective is Exseed's Exploration of Self Esteem Model technological innovation in exploring the education 5.0 based self esteem model for special intelligent students?
2. Is Exseed's Exploration of Self Esteem Model technological innovation effective as an interactive and relevant learning platform for developing self-esteem?
3. How effective is the development of Exseed's Exploration of Self Esteem Model technological innovation for mapping the self esteem of special intelligent students?
4. How effective is Exseed's Exploration of Self Esteem Model technological innovation in providing rewards and strengthening self-esteem for special intelligent students?

literature review

A. Self-Esteem of Special Smart Students

Special intelligent students are students who have abilities and intelligence above average or can be said to be students who have high creativity. (Sugiart R, 2018). They are categorized as children who have high or above average intellectual abilities. (Sugiarti R E. E., 2022) The term Special Intelligence (CI) or often called "the gifted" means very intelligent, brilliant, has superior mental abilities. "Giftedness" refers to extraordinary intellectual capacity, or better known as intellectual giftedness. (Sugiarti R E. E., 2021). The definition of gifted students is those identified by professionally qualified people as having extraordinary abilities and capable of high achievement. These students need differentiated educational services and/or services outside the scope of regular school services in order to realize their contribution to themselves and society. The definition of students who have special intelligence potential is that they are identified as students who have achieved satisfactory achievements, and have general intellectual abilities that function at an intelligent level, adequate creativity, and relatively good engagement with tasks.

Every student has the need to develop self-esteem as personality capital so that they become more mature when they become members of society in the future, including special intelligent students. (Sugiarti R R. R.) Self-esteem is a description of a person's overall subjective feelings about their own meaning or personal value. Self-esteem is an evaluation process that individuals direct towards themselves, which is later related to the process of individual acceptance of themselves. (Jamal Na, 2022) In this case, the evaluation will describe how the individual assesses himself or herself, shows appreciation and recognition or not, and shows the extent to which the individual feels capable, successful and valuable. In short, self-esteem is defined as an assessment of one's self-worth which is expressed through the attitudes held by the individual. (Backman H, 2020)

Self-esteem develops and is formed based on realistic reasons from individual interactions in the environment and on a number of other people's appreciation of him. The higher the self-esteem, the easier it is for the special intelligent student to adapt to the surrounding environment. (Gracia JA, y olmos FC, Matheu ML, Carreno TP., 2019). Self-esteem is a process of assessment carried out by a person towards himself. Because it relates to oneself, this assessment usually reflects acceptance or rejection of oneself, showing how far the individual believes that he is capable, feels important, successful and valuable. (OT., 2020) Self-esteem can influence various aspects of life, especially for special intelligent students.

Having good self-esteem can make it easier for special intelligent students to understand, appreciate and love themselves, especially with all their potential. (Seim AR, 2021). Self-esteem in special intelligent students means they have strength, significance, virtue and competence within themselves. (Seim AR J. T., 2021)

B. Education in the Era of Society 5.0

Society 5.0 was just launched in 2019 which was created as a resolution for the industrial revolution 4.0; where society begins to interact with new technology and integrate it into everyday life (1).

Society 5.0 is increasingly becoming an important topic in global discussions about social and economic transformation in the digital era. This concept carries a vision of how society can utilize digital technology to achieve significant progress in various aspects of life (10). Society 5.0 is a picture of a future where technology is used to provide solutions to social problems, improve our quality of life, and have a positive impact on society as a whole. (Wirawan R, 2023). It can be said that society 5.0 is a concept of society that is human-centered and technology-based. In this era, society is expected to be able to solve various social challenges and problems by utilizing various innovations born in the industrial revolution 4.0 era to improve the quality of human life. Based on this, it can be said that the Society 5.0 era focuses on the human component by utilizing artificial intelligence as a tool/media in the learning process (11).

Special intelligent students are a generation that will excel in the future in the era of society 5.0 and have competencies, including (1) having a level of intelligence that matches their talents and interests; (2) have the ability to think clearly and critically; (3) have communication skills; (4) have the ability to be a responsible citizen; (5) have readiness to work; (6) have a sense of responsibility for environmental sustainability; (7) have the ability to try to understand and be tolerant of different views; (8) have broad interests in life; (9) have the ability to live in a globalized society. (Erlangga E, 2021).

Education is a process, technique and teaching and learning method with the aim of transferring knowledge from one person to another through systematic and organized procedures that take place over a relatively long period of time. Education has a very important role in giving birth to the nation's next generation who are qualified, have reliable abilities in facing challenges and are able to innovate in a better direction. (Shofwan I, 2019) The world of education in the era of society 5.0 is expected to be able to present more meaningful learning activities by creating fun learning for special intelligent students (25).

Society 5.0 education for special intelligent students means adopting the latest technology in teaching and learning, such as adaptive learning, artificial intelligence, virtual reality, and project-based learning; encouraging collaboration between teachers and technology to create learning experiences that are interesting, relevant and connected to the real world, which is in accordance with the concept of education 5.0; identify challenges and opportunities in the education system that can be addressed through technological innovation, learning differentiation, curriculum personalization, or online learning accessibility; and apply a rigorous research approach to understand the root of the problem and create effective solutions using the latest technology. (Sugiarti R M. N., 2021).

Furthermore, society 5.0 education for exceptionally intelligent students also includes comprehensive character education, with a focus on developing values such as integrity, empathy, honesty, and social responsibility. In addition, it also provides opportunities for exceptionally intelligent students to apply character values in daily activities and reinforce positive behavior through constructive feedback.

Society 5.0 education for exceptionally intelligent students comprehensively integrates the principles of self-esteem formation in the educational environment, such as providing recognition for their achievements, building self-confidence through achievement, and providing positive social support; and conducting continuous evaluation of the effectiveness of strategies implemented to improve their self-esteem, and adjusting the approach according to individual needs. (Shek DTL, 2021). Through society 5.0 education, the latest technology is adopted in teaching and learning, such as adaptive learning, artificial intelligence, virtual reality, and project-based learning, thus encouraging collaboration between teachers and technology to create interesting, relevant, and real-world learning experiences, which are in accordance with the concept of education 5.0 for exceptionally intelligent students.

More broadly, society 5.0 education for exceptionally intelligent students can incorporate character education into the learning process as a whole, with a focus on developing values such as integrity, empathy, honesty, and social responsibility. This technology-based education also provides opportunities for students to apply character values in daily activities and reinforce positive behavior through constructive feedback. (den Bor L, 2021)

Materials and Methods

This study uses the waterfall method . (Konig CM, 2024). The waterfall method is a software development model that if analogized, its working method is like a waterfall, because each stage is done sequentially from top to bottom. The advantage of using the waterfall method is that this method allows for departmentalization and control. The development process of the one-by-one phase model, thus minimizing possible errors. Waterfall when interpreted in the literature means waterfall. However, for computer science and information technology, waterfall is one type of method used in carrying out system development. (F., 2022)

The waterfall method has five stages in the process, namely requirements analysis, design, implementation, testing, and deployment & maintenance. (Triansyah J, 2022). The flow of technological innovation development using the waterfall method looks like the flow below:

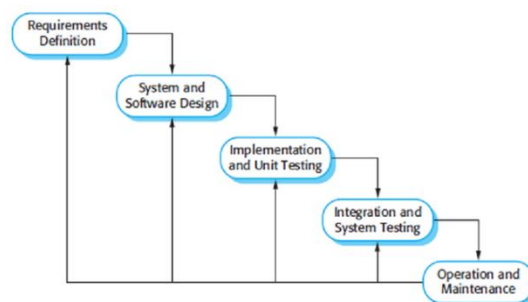


Figure 3.1
Waterfall Method Workflow

Exploration of Self Esteem Model (Exseed).

The concept of this method is the work carried out in an orderly, sequential, and linear manner (34). The technological innovation of this waterfall method was developed and applied based on the concepts of Education 5.0. This waterfall method is applied to explore the technology-based self-esteem model in exceptionally intelligent students.

This method involves the development of a technology-based learning platform that includes elements such as artificial intelligence (AI) for learning personalization, augmented reality (AR) or virtual reality (VR) to create an immersive learning experience. (Boström L, 2022). and an automatic feedback system to provide recognition for the achievements of exceptionally intelligent students; where researchers then named this platform as the Exploration of Self Esteem Model (Exseed) in exceptionally intelligent students.

The Self Esteem explored in exceptionally intelligent students includes dimensions as in the table below:

Dimensions	Indicator
Power	<ul style="list-style-type: none">• Manage and control• The behavior of others
	<ul style="list-style-type: none">• Recognition and taste• Respect from others
	<ul style="list-style-type: none">• Controlling one's own behavior
Significance	<ul style="list-style-type: none">• Self-acceptance
	<ul style="list-style-type: none">• Acceptance from family
	<ul style="list-style-type: none">• Acceptance from friends

	<ul style="list-style-type: none">• Self popularity
Virtue	<ul style="list-style-type: none">• Adhere to moral ethics
	<ul style="list-style-type: none">• Adhere to religious rules/principles
	<ul style="list-style-type: none">• Concern for others
Competence	<ul style="list-style-type: none">• Able to carry out responsibilities well
	<ul style="list-style-type: none">• Able to deal with social situations
	<ul style="list-style-type: none">• Able to achieve
	<ul style="list-style-type: none">• Solve the problem
	<ul style="list-style-type: none">• Make decisions

Result and Discussion

Implementation of Research Activities

This research was conducted at Jekulo State Junior High School, Kudus, Central Java. A total of 20 exceptionally intelligent students were selected as subjects in this experimental research. The steps taken in this research activity are shown in the image below.



Figure 4.

Technology Innovation Features in Exploration of Self Esteem Model (Exseed) in Specially Intelligent Students

The features of technological innovation in the Exploration of Self Esteem Model (Exseed) on Specially Intelligent Students in this study are as follows:

- Interactive Learning Platform: an interactive Exploration of Self Esteem Model (Exseed) learning platform that is tailored to the needs of specially intelligent students. This includes learning content that is tailored to the level of understanding and interests of students, as well as providing a variety of relevant resources for the development of their self-esteem.
- Mapping the Progress of Specially Intelligent Students: A feature to monitor and track their progress in recognizing and developing self-esteem. This mapping can help teachers and parents understand which areas need further attention and develop appropriate strategies to support the development of their self-esteem.
- Virtual Classes and Group Discussions: Allows special intelligent students to participate in virtual classes and group discussions that promote collaboration, communication, and active engagement. This not only supports their learning, but also strengthens social interaction and the development of interpersonal skills among them.
- Online Mentors: provide access to online mentors who can provide individual support to special intelligent students. These mentors can guide them in setting goals, overcoming obstacles, and building confidence in themselves.
- Support Community: Building an online community that provides a safe space for exceptionally intelligent students to share their experiences, challenges, and achievements. This community can also include discussion forums, webinars, and special events to facilitate the exchange of information and support between them.
- 360 Degree Feedback: implementing a 360-degree feedback system that involves teachers, peers, parents, and exceptionally intelligent students themselves in providing constructive feedback on progress and development in strengthening their character and self-esteem.
- Awards and Recognition: Creating a reward and recognition system that strengthens the self-esteem of exceptionally intelligent students.

The Exploration of Self Esteem Model (Exseed) research method for Specially Intelligent Students is designed to provide a deeper understanding of how technological innovation in exploring the self-esteem model based on Education 5.0 can empower exceptionally intelligent students in developing their self-esteem.

With a comprehensive and goal-oriented approach, it is hoped that this research can make a positive contribution to the literature and practice of inclusive education (25).

The indicators of achievement in this study are as follows:

- Self-Improvement: The use of technology to build students' self-esteem can be measured through increased self-confidence, self-confidence, and self-esteem.

[illegible]

This diagram illustrates the relationship between three main variables: **Self-Esteem**, **Family Support**, and **Adjustment**. Each of these variables is represented by a blue circle, with connecting lines indicating the influence or correlation between the three.

- **Self-Esteem:** Located on the left side of the diagram, this variable represents the degree to which a person believes in their own worth or how much they value themselves.
- **Family Support:** Located in the middle, this variable indicates the level of emotional, instrumental, and informational support a person receives from their family. Family support serves as a mediating factor between self-esteem and adjustment.
- **Adjustment:** Located on the right side of the diagram, adjustment refers to a person's ability to adapt to new situations, manage stress, and maintain psychological well-being. Adjustment is influenced by self-esteem and family support.

- The lines connecting the circles indicate the relationships between these variables, with numerical values representing the strength of the relationships. These values indicate how strongly one variable influences the other.

- Small yellow boxes with additional numbers attached to each of the major variables provide further insight into the specific components or sub-factors associated with self-esteem, family support, and adjustment.

Correlation between Self-Esteem and Adjustment ($r = .65$):

This positive correlation indicates that the higher a person's self-esteem, the better their adjustment. This makes sense because people with high self-esteem tend to feel more confident and better able to cope with life's challenges.

Correlation between Family Support and Adjustment ($r = 0.70$):

This correlation shows that strong family support is closely related to an individual's ability to adapt. Emotional and instrumental support from the family can provide a sense of security and increase an individual's ability to adapt to new situations or deal with stress.

Correlation between Self-Esteem and Family Support ($r = 0.55$):

This correlation shows that there is a positive relationship between self-esteem and family support, although it is not as strong as the relationship between other variables. This may mean that although family support is important, self-esteem can also be influenced by other factors such as the wider social environment or personal experiences.

Based on these correlation figures, the following can be concluded:

Effective Mediator: Family support functions as a strong mediator in the relationship between self-esteem and adjustment. That is, high self-esteem may directly improve adjustment, but this effect may be strengthened if a person also receives support from his family. Importance of Family Support: Family support plays a key role in helping individuals adjust, perhaps even more powerfully than self-esteem. This emphasizes the importance of a supportive family environment in a person's psychological development. Psychological Interventions: Interventions aimed at improving individual adjustment should consider increasing self-esteem and strengthening family support. For example, family therapy or self-development programs aimed at improving self-esteem can be effective strategies.

The positive relationships between "Self-Esteem," "Family Support," and "Adjustment" indicate that these three variables influence each other and together contribute to an individual's psychological well-being. Family support appears to be the most significant factor in influencing adjustment ability, but self-esteem also plays an important role.

In research conducted by Rini Sugiarti and Erwin Erlangga from Semarang University, it was found that family support plays a key role in increasing self-esteem and adjustment in adolescents (16).

This research also shows that adolescents who receive emotional support and instrumental support from their families tend to have higher levels of self-esteem, which in turn influences their ability to adapt in various social and academic situations.

Integration with Correlation Analysis

Correlation between Self-Esteem and Self-Adjustment:

Sugiarti and Erlangga (3) emphasized that strong self-esteem, which is often fostered through positive family support, significantly increases an individual's ability to adapt. This is in line with the positive correlation ($r = 0.65$) which shows that the higher the self-esteem, the better the adjustment.

Sugiarti and Erlangga (3) emphasized that strong self-esteem, which is often fostered through positive family support, significantly increases an individual's ability to adapt. This is in line with the positive correlation ($r = 0.65$) which shows that the higher the self-esteem, the better the adjustment.

Correlation between Family Support and Adjustment:

This research also found that family support has a very strong correlation with adjustment ability ($r = 0.70$). These findings show that support from family not only provides a sense of security but also strengthens individuals in facing life's challenges.

Correlation between Self-Esteem and Family Support:

Sugiarti and Erlangga also revealed that although self-esteem is influenced by various factors, family support is one of the most influential ($r = 0.55$). This highlights the importance of a supportive family environment in the formation of self-esteem, which then has a positive impact on adjustment (3).

CONCLUSION

Conclusions from Related Research

Research from Sugiarti and Erlangga (28) underlines the importance of the role of the family in the psychological development of adolescents. It found that family support not only influences self-esteem but also strengthens the relationship between self-esteem and adjustment. Therefore, interventions aimed at improving adjustment in adolescents

should focus on strengthening family support and increasing self-esteem interrelated steps [Rini Sugiarti & Erwin Erlangga, Semarang University] .

Thus, this research provides a strong basis to support the correlation findings in this analysis, and confirms the importance of a holistic approach in understanding the factors that influence individual adjustment.

CONFLICT OF INTEREST

There are no conflicts of interest in conducting this research.

I. AUTHOR CONTRIBUTIONS

1. Rini Sugiarti

- a. Prepare a research proposal that includes background, objectives, methodology, schedule and budget.
- b. Create a detailed work plan for the entire research team, including division of tasks and implementation schedule.
- c. Coordinate team members' tasks, ensure effective communication, and hold regular meetings to monitor progress.
- d. Organize and manage research budgets, ensuring funds are used according to plan.
- e. Ensure all necessary equipment and materials are available and functioning properly.
- f. Ensure that all research processes are carried out according to established standards and procedures.
- g. Provide guidance and support to team members, especially in terms of research methodology and data analysis.
- h. Oversee the data collection process to ensure data accuracy and reliability.
- i. Leads the data analysis process, ensuring proper interpretation of the results obtained.
- j. Prepare a final research report that is comprehensive and in accordance with the specified format.
- k. Organize the publication of research results in scientific journals or other media, and convey findings to relevant stakeholders.
- l. Conduct a thorough evaluation of the research process and results, identifying strengths and weaknesses.
- m. Develop recommendations for further research or practical implementation of research findings

2. Erwin Erlangga

- a. Collect and review relevant literature about technological innovation, self-esteem, education 5.0, and character. Compile a comprehensive literature review.
- b. Assist in designing questionnaires or other instruments for primary data collection. Ensure the instrument is valid and reliable.
- c. Organize and supervise field data collection, including surveys, interviews, or observations. Ensure data is collected accurately and according to procedures.
- d. Perform data entry and check the completeness and accuracy of the data that has been collected.
- e. Carrying out relevant statistical tests to test research hypotheses.
- f. Preparation of Reports and Documentation.
- g. Prepare regular reports on research progress to be presented at team meetings.
- h. Compile and store documentation of all research data in a neat and organized manner.
- i. Coordinate and collaborate with other team members to ensure that all aspects of research are well integrated.
- j. Communicate effectively with the chair and other team members to overcome obstacles and ensure a smooth research process.
- k. Assist in compiling presentations of research results for dissemination at conferences or seminars.

3. Agusta Praba Ristadi Pinem

- a. Conduct research and identify the latest technological innovations relevant to education 5.0
- b. Develop technology implementation plans in educational contexts, including integration with curriculum and learning activities.
- c. Assist in designing character development programs that are in accordance with the principles of education 5.0.

- d. Evaluate the character development program implemented, including measuring the results and impact on students.
- e. Manage and analyze data related to the use of technology in learning, including effectiveness and obstacles faced.
- f. Analyze data regarding the impact of character development programs on students, including behavior changes and increased self-esteem.
- g. Assist in the development of learning modules that integrate technological innovation and character development.
- h. Develop educational materials that support the self-esteem and education 5.0 model.
- i. Organize and facilitate training for teachers regarding the use of technology in learning and character development strategies.
- j. Design and conduct workshops for students that focus on increasing self-esteem and the use of technology in learning.
- k. Prepare regular reports regarding progress and results achieved, as well as identifying areas that require improvement.
- l. Communicate with the school and other stakeholders to ensure their support and participation in the research.
- m. Establish partnerships with experts in the fields of educational technology and character development to obtain input and support.

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