

Implementation of Innovational Research Model to Boost-Up Innovation among School Children

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Abstract:

Only a handful of research have examined whether active learning environments are geared toward fostering students' innovation competency and whether students believe they have acquired this competence or not. To amplify this innovation's impact, The importance of research cannot be overstated, and students in elementary school should be encouraged to develop a curiosity for learning about it. The word "research" itself connotes an attempt to do something new and different that is of high quality and originality. If this type of cutting-edge study is carried out, it will have a huge impact on the scientific community. The public will benefit from such research if it is taught in schools. It is possible to improve education for all students by utilizing cutting-edge research methods. Knowledge and awareness of facts and information are not enough in today's competitive environment to have a long and successful career. Rather, students who want to be successful in their careers should stand out from the crowd by being creative in how they approach their work. It is the goal of this project to examine the role that research plays in education and the various means through which it may be encouraged inside educational institutions. This article focuses on a variety of topics, including quality, accountability, and budget. The development of new educational programs necessitates the encouragement of experimentation. It's critical to find out how these new activities affect student learning, creativity, and academic accomplishment instead of simply replacing the old ones with new ones based on research.

Keywords: Student learning, Knowledge, Awareness, carrier, Academic;

1. INTRODUCTION:

The Iot technology (IoT) has fundamentally altered the conditions of daily life [1] and the old educational paradigm [2]–[4]. All aspects of life can now be conducted online, including the educational process and the development of learning strategies. Digital literacy has become an essential feature of modern human existence [5], [6] in the modern era. Universities all across the world are embracing e-learning as a method of teaching and learning [7]. Anecdotal evidence suggests the usage of e-learning as a teaching tool can improve student motivation and learning outcomes. With the use of e-learning, instructors and students may both solve the issue of huge student numbers and provide easy and quick access to the learning experience [8,9].

In Indonesia, and particularly at Universitas Malang [10], e-learning is a critical component of educational media. It has been a year and a half since Universitas Negeri Malang's curriculum underwent a shift from expert education to life-based learning, from professional development models to capacity building models. This method has ramifications for a variety of other techniques and methods of instruction. Students in life-based learning engage in activities that challenge their thinking and social skills, provide authentic and real-world experiences, are multidisciplinary in nature and cross-disciplinary in nature as well as dynamic and responsive to the diversity of students [21]. A second term for these activities is "integrated assessments in learning," which refers to a variety of methods for tracking student development and monitoring student performance. Life-based learning, on the other hand, focuses on the idea that students are both creatures and sources of information, capable of developing their own knowledge as well as engaging in genuine and collaborative learning. Professors in a life-based learning setting take on the roles of both educators and designers of the classroom environment, working with students as partners in problem solving rather than simply lecturers [20].

Competence, skillfulness and multitasking are examples of learning objectives that can be exhibited by the ability to perform anything and conquer new life's challenges. In addition, a high level of creativity and self-efficacy are included in the definition of capability. A person's capacity, then, measures how far he or she can develop his or her competence [10]. In order to achieve this goal, it is necessary to create research-based learning innovations by embedding study into the learning process. Based on the constructivist concept of learning, this research-based education incorporates a range of learning strategies such as analytical, cooperative learning & contextual learning. [11] Introducing students to various of academic subjects through the study of academic works and the development of technical and analytical expertise is an important part of research-based learning. Knowledge is gained through research in the second phase. The capstone project culminates in a public oral and written presentation of the research findings. A student's final project should reflect their learning and research experiences, and should include a presentation of their findings in writing and spoken form as well as publication in peer-reviewed journals [11].

Research-based learning, according to Sabri [12], provides students with a firm foundation in core concepts and processes, as well as the ability to address problems imaginatively, logically, and methodically. In the second place, students have a logical mindset, which is open, honest, and always searching for the truth. Third, students are capable of adapting, working in groups, and competing because they possess competitive communication, technical, and analytical skills. Developing and improving students' abilities and skillsets is a fourth benefit pupils receive. As a last point, students have a strong desire to study and are given many opportunities to participate actively in the learning process. Discipline and practical experience are also taught in order to help students develop a sense of morality [22]. Students' abilities will be enhanced by the incorporation of research-based learning methods with online learning in this study [23][24].

2. Background:

Research should accompany the new millennium's teaching style. Research can be used to support the efficacy of teaching practices and classroom practices. Teaching and research are currently separated by a wide margin. Thus, classroom teachers and researchers must collaborate to achieve higher academic effect and link the gap among research on successful education & training practice, which will lead to the success of educational practitioners in accomplishing the central core. If we want to close the knowledge gap between classrooms and laboratories, we need to encourage and partner with educators and researchers around the world to work together, collaborate, and innovate. In today's society, a well-crafted syllabus is also necessary to meet the demands of new technology. One of the most common teaching methods is the incorporation of research into lectures, as well as involving students in the research process.

3. LITERATURE REVIEW

3.1. Concept of Teaching:

In a broader sense, a teacher is a person who uses a medium to impart knowledge to a student or group of students. The person who disseminates information is the instructor [13]. The learner is taught by the teacher. Teaching is a jigsaw puzzle of unseen activities, all of which are designed to promote a student's internal learning process. In general, teachers play one of two roles, according to Howe [14]: A teacher's role in the past and a learner's role in the present [32][33].

The traditional position is being phased out in favor of a more modern one. Students learn more efficiently and

effectively when their lecturers enhance their prior knowledge [34][35]. Individuals' ability to learn varies, and each individual absorbs information at a rate that is unique to them. As a result, the concept of effective teaching relies heavily on experience[25].

3.2. The Concept of Innovation

In the long run, businesses that have the innovativeness will continue to thrive. These are the organizations that are most likely to innovate quickly and profitably because they use key resources as a significant stimulus for innovation and improvement of organizational condition. Being able to consistently create new products, procedures, and systems demonstrates one's capacity for innovation. It has become a top priority for most organizations to constantly do research in order to generate new ideas and innovations. Due to technical advancement and fierce worldwide product and service competition, innovation has become a critical source of competitive advantage. [15][26]

The notion and meaning of innovation are of great interest to scholars, businesses, and educational systems. The way in which innovation is defined in most businesses is usually determined by the activities conducted place within the organization and the jobs that will be outsourced. The definition assigned to innovation usually dictates its essence and scope within a given business. As a result, organizations' definitions of innovation have a direct impact on how ideas are processed[27][36].

3.3 Attributes of innovation:

If an organization is innovative, certain of its features may be affected by its type, according to Downs and Mohr [16]. The applicability and compatibility of innovation varies greatly between organizations. Traits like this are referred to as "secondary attributes of innovation." Innovation in education differs greatly from innovation in other sectors like manufacturing and consulting, so this is a legitimate point to raise in discussion.

The qualities of the context in which innovation takes place that are most directly linked to the industrial context are the primary attributes of innovation. These are the traits that are carried through from one company to the next. Another aspect of innovation that has been emphasized by several authors (Damanpour [34]; Dewar and Dutton [18]) is the degree and impact on organizational competencies[28].

3.4 Innovation typology:

Damanpour [19] explored the differences between social, administrative, and technical innovations in the research on innovation. There is a difference between incremental and radical innovation, according to Maclean and Duncan [20], North and Toker [21]. Marino [22] divided innovation adoption into two distinct stages: initiation and implementation. Administrative-technical, Process-product, and Radical-incremental innovation are three forms of innovation identified by Anderson [19][17][29].

3.5 Significance of Innovative Research in Education:

Academic research continues to be a major source of new information and ideas at the local, regional, and global levels. It is the teacher's ability to connect theory with practice in the classroom that makes or breaks a lesson, as it determines whether or not students truly learn something that matters. Therefore, effective teaching/learning requires the use of fresh research/theory in the classroom.

In order to better understand policies and processes, instructional methodologies and program curricula, as well as the involvement of stakeholders, research is required. We hope to discover educational program elements that effectively promote formal learning knowledge and abilities through our unique research[.

In nations with strong innovation systems, research is prioritized in a range of settings, including institutions and the business sector, according to the UNESCO Forum Report (2001-2009). When it comes to national development, OECD (Organisation for Economic Co-operation and Development) Individual states' governments have recently placed an unprecedented focus on research as a driving force.

Research has made a significant contribution to our understanding of other countries and the influence of culture on beliefs, attitudes, ideals, personality development, and human behavior. In order to find a good balance between individual and social needs, we must keep looking. For curriculums to create high school graduates with the basic communication and professional experience and professional competencies required to adapt to future unpredictable changes in society, we definitely need more complex tools and novel approaches to reaching the will of the people.

3.6. Conceptual Research Model:

Figure.1 shows the conceptual model that was constructed following a review of the relevant literature. This typical model portrays the relationship between 4D teaching pedagogy and its outcomes such as analytical skill development, generating creative ideas, and self-learning capabilities.

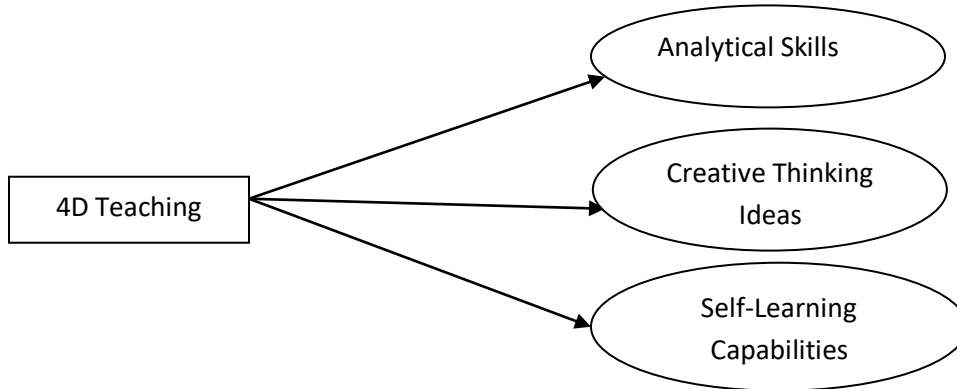


Fig.1. Conceptual Research Design

Alternative Hypothesis (H1): Different age groups of school children have a significant difference in perceiving different innovation skills while implementing 4D teaching tools.

4. METHOD FOR IMPROVING INNOVATION COMPETENCE

4-D models were employed in this work for research and development. The four stages of this paradigm are defined, designed, developed, and disseminated. This model was selected for its appropriateness to the project's requirements." Lecture design and a research-based learning paradigm are used in product development. A full description of the semester's lecture plan is provided. It is also connected with online courses on sipejar.umacsid, a website for Indonesian universities. Learning flow, discussions, projects, and access to numerous learning materials are implemented using this online class as a guide. In an online classroom, synchronous and asynchronous activities are possible. Online in real time is synchronous. An asynchronous class is one that can be taken at any hour of the day or night [10]. The Political Science learning approach course at the Department of Social Science at Universities Negeri Malang was selected for this development. Observations and questionnaires were used to gather data. In addition, as illustrated in the following diagram, the 4-D model is used at various stages of product development.



Fig.2.4-D Innovation Model[23]

The 4-D approach begins with a student requirements analysis and the establishment of learning objectives. The preliminary design and production of a learning summary is the focus of the design phase. In addition, expert verification and revision are performed during the development phase or early design trial stage. Students in a Social Studies learning approach course are then asked to participate in an evaluation of the result. The final step is to disseminate, which is the process of distributing the product on a larger scale.

5. VALIDATION OF TEST DATA:

The model's content, structure, and technical terminology are tested to ensure its validity. Experts in instructional design and the media are involved in the process of validating the results. Both valutors contribute to the model's improvement by offering suggestions and evaluating its performance. Research-based learning models' appropriateness with concepts and theories will be tested to see if this model's steps and tools can stand up to validation. This study's research-based innovative learning model is deemed an interactive learning paradigm based on the validation results since it encourages students to work together, critically think, and be creative. As a result, this model of learning is thought to be useful in the classroom. However, in order to avoid misconceptions in the process of giving interpretation to the model's substance, there are still some items that need to be finished and clarified. Even though this approach makes use of learning research, the study itself is still on the short side, hence the term "mini-research." Students will learn about research as a result of this lesson.

Students are required to answer a questionnaire at the end of each learning session to evaluate the effectiveness of the research-based instructional leaders they just completed. Research methodologies based on a study conducted through e-learning are provided in the following table. In three ways, students benefit from e-learning research methodologies: Advantages and drawbacks of e-learning, as well as advantages and disadvantages for students. Students' thoughts on the e-learning research innovation learning paradigm are as follows.

5.1 Research Design and Methodology

The study has been evaluated based on primary data which was collected from different schools from concerned cities of Andhra Pradesh.

Table 1. Sample Design

Sl. No.	Cities	Sample
1.	Visakhapatnam	120
2.	Vijayawada	120
3.	Tirupati	120
	Total	360

Source: Field Study

In Andhra Pradesh there were 32 cities among them by using random sampling technique three cities have been selected for study purpose namely Visakhapatnam, Vijayawada and Tirupati. From each city 120 sample respondents have been chosen at random from multiple schools. All the 360 sample respondents are in between the age group of 05 and 15 years only.

Table 2. E-Learning Usage: Student Feedback

	A	B	C	Average
Age Group	Analytical Skills(%)	Creative Thinking Ideas(%)	Self Learning Capabilities (%)	
5-8	82	74	56	70.66
9-12	86	79	65	76.66
13-15	89	85	74	82.6

Source: Field Study

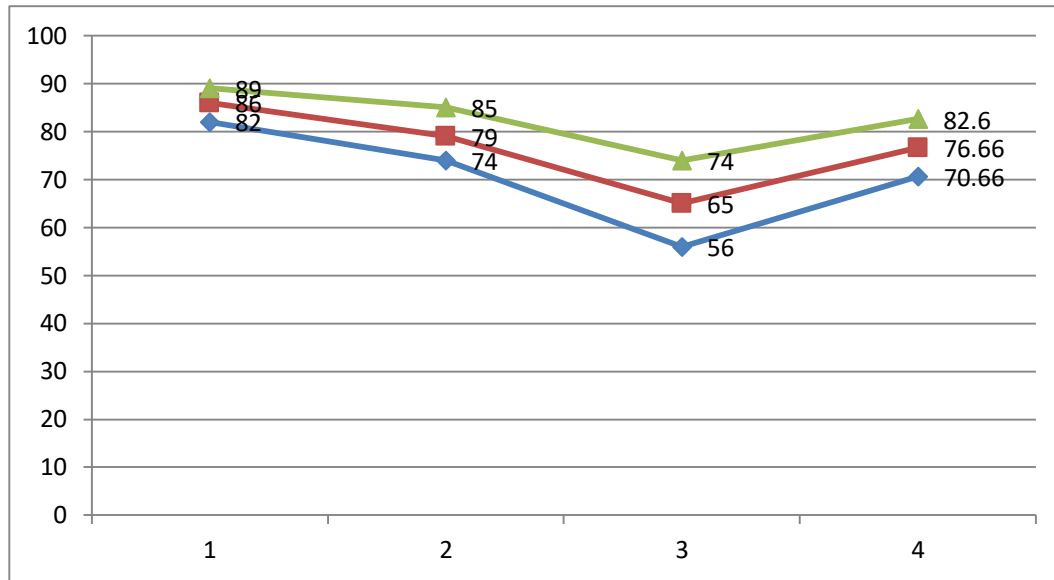


Figure-2: Results of the Assessment

5.2 Analysis Result of Hypothesis

Table 3. ANOVA Test Results

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	91.467	2	45.733	4.467	0.021
Within Groups	276.400	117	10.237		
Total	367.867	119			

To see if there is a statistical difference between our groups' means, we ran an ANOVA. To put it another way, the significance value ($p = 0.021$) is below the threshold for statistical significance. As a result, there is a statistical significant variation in the mean 3D learning outcomes across the various age groups studied.

Therefore, the **Alternative Hypothesis (H1)**: “Different age groups of school children have a significant difference in perceiving different innovation skills while implementing 4D teaching tools” is accepted.

5.CONCLUSION:

One of the most important issues in the society now is schooling for sustainable development (ESD). As part of the shift towards a more sustainable society, the UN Decade for ESD has promoted new educational approaches. It is possible for students to explore the possibility for customizing and providing the knowledge they will need in their future lives through the use of e-research-based learnings and innovation learning approaches. E-learning and a research-based innovation approach, on the other hand, offer an effective, efficient learning technique and can help students enhance their ability to deal with real-life situations. The developing countries should concentrate on this subject matter so that the nation may be build by the future citizens' of respected country.

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