Journal of Informatics and Vocational Education (JOIVE)
Vol. 8, No.2, July 2024, pp. 35~55
ISSN: 2746-7813

Learning Innovation Strategies and Their Role in Promoting Student Active Participation in Informatics Education: A Qualitative Inquiry

Aysie Safar Abdul Majid[1], Aris Budianto[2], Basuki Sri Wibowo*[3]
[1]Teacher Professional Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Indonesia
[2]Department of Informatics Education, Universitas Sebelas Maret, Indonesia
[3]Senior High School 1 Kartasura, Sukoharjo, Indonesia

Article Info

Article history:

Received Jan 6, 2025
Revised May 15, 2025
Accepted Jul 1, 2025

Corresponding Author:

Aris Budianto,
Department of Informatics Education, Universitas Sebelas Maret
Jl. A. Yani No.200, Dusun II, Makamhaji, Kec. Kartasura, Kabupaten Sukoharjo, Jawa Tengah, Indonesia, 57161
Email: arisbudianto@staff.uns.ac.id

ABSTRACT

Active student participation is a recognized indicator of effective learning, yet passive engagement remains prevalent in Indonesian secondary classrooms, particularly in technology-intensive subjects such as Informatics. This qualitative descriptive study investigated how learning innovations implemented by an Informatics teacher influenced student active participation at a senior high school in Sukoharjo, Central Java, Indonesia. Using purposive sampling, eight participants were selected, comprising seven Grade XI students (six female, one male) and one experienced Informatics teacher. Data was collected through a direct semi-structured teacher interview of approximately 30 minutes, structured written responses from students comprising 13 open-ended questions, and classroom observation. Data was analyzed using thematic analysis. Three key themes emerged from the findings. First, practical and laboratory-based activities were the primary drivers of student engagement, with six of seven students reporting higher motivation during hands-on sessions. Second, teacher instructional methods, particularly interactive, discussion-based, and project-oriented approaches, directly influenced students' willingness to ask questions and contribute to group work. Third, individual interest in Informatics varied considerably, with one student expressing low motivation due to language barriers in English-language materials, highlighting the need for differentiated instruction. These findings suggest that contextually relevant, practice-centered learning innovations are essential for fostering active participation in Informatics education at the senior high school level in Indonesia.

Keywords: Learning innovation; Active participation; Informatics education; Qualitative descriptive; Project-Based Learning

1. INTRODUCTION

PISA 2022 data indicate that more than three in four 15-year-olds in Indonesia did not meet minimum proficiency standards in reading, mathematics, and science, a result that reflects deep-seated challenges not only in curriculum content but also in how learning is delivered in Indonesian classrooms (OECD, 2023). A large-scale survey of 1,935 teachers and students across secondary schools in DKI Jakarta identified urgent needs for more active and innovation-driven instructional approaches as a core requirement for implementing the Merdeka Belajar curriculum, suggesting that passive, teacher-centered learning remains the prevailing norm rather than the exception(Arung et al., 2023). Most teachers in Indonesia still utilize traditional methods rather than advancing information technology integration and implementing technology-based learning comes

with tremendous challenges that should be addressed carefully(Bannus & Emeral, 2025; Kurniawan & Maryani, 2025). This challenge is particularly acute in Informatics, a subject that demands computational thinking, problem-solving, and hands-on engagement, where conventional teacher-centered methods frequently fail to stimulate meaningful student involvement(Flogie et al., 2025; Maulidia et al., 2025). Active learning consistently improves outcomes in education, with problem-based learning, gamification, and collaboration enhancing both engagement and performance, yet many computer science courses still rely on static lectures where students remain passive participants(Díaz-Lauzurica & Moreno-Salinas, 2025).

Learning innovation has emerged as a central response to the persistent challenge of student passivity in secondary education. Effective integration of ICT tools at different levels of education enables educational stakeholders to create an interactive learning environment and increase student learning engagement(Cabalbag, 2025). Innovation in learning does not solely depend on sophisticated technology; it encompasses the adoption of instructional methods that actively involve students in the construction of knowledge, including cooperative learning, collaborative tasks, and project-oriented approaches(Ngoc et al., 2025; Rohana et al., 2023). Project-Based Learning has been shown to produce significant enhancement in collaborative learning, problem-solving, critical thinking, and positive attitudes among students in high school settings(Rasyid & Khoirunnisa, 2021; Yuniwati & Sitepu, 2025). These findings align with the growing recognition that active, student-centered approaches consistently outperform conventional teacher-centered instruction in promoting meaningful engagement.

The role of the teacher in implementing learning innovation is equally critical. Teacher instructional style, including the quality of interpersonal interaction and the design of learning activities, has been consistently linked to students' willingness to participate and their overall motivation(Asadpour et al., 2025; Xu et al., 2025). Active learning strategies, including project-based learning, technological integration, group activities, and hands-on tasks, have been documented as effective in secondary school contexts, though challenges such as limited resources, teacher training, and cultural considerations may affect implementation(Syahroni, 2025). In the specific context of Informatics at the senior high school level in Indonesia, these challenges are compounded by students' varying degrees of technological familiarity and the subject's inherent demand for computational and analytical thinking. The Sukoharjo context is particularly relevant because it represents a mid-size urban district in Central Java where Merdeka Belajar curriculum reforms have been implemented, but empirical evidence on their classroom-level impact on student participation remains limited. Qualitative inquiry into how teachers and students in this context experience and respond to learning innovation, therefore, addresses a gap that is both locally significant and nationally relevant.

While prior studies have examined active participation in general classroom settings and project-based learning in vocational school contexts, empirical qualitative evidence specifically focusing on the Informatics subject in Indonesian senior high schools remains scarce(Setyo Anggraini et al., 2025). Existing research in this domain predominantly employs quantitative instruments such as questionnaires and pre-post tests, which capture measurable learning outcomes but leave the nuanced experiential perspectives of both students and teachers largely underexplored(Arung et al., 2023). Furthermore, most studies on learning innovation in Indonesia have been conducted in urban metropolitan contexts such as Jakarta and Surabaya, with limited attention to mid-size districts such as Sukoharjo, where infrastructural conditions, teacher preparedness, and student backgrounds may differ considerably. The specific intersection of learning innovation, student active participation, and Informatics subject content at the senior high school level in this regional context, therefore, represents an understudied area that warrants dedicated qualitative inquiry.

This study aims to explore how learning innovations implemented by an Informatics teacher are experienced and perceived by students in terms of their active participation in learning at a senior high school in Sukoharjo. To guide this exploration, the study addresses the following research questions. First, what learning innovations does the Informatics teacher implement to promote active student participation? Second, how do students perceive and respond to these learning innovations in relation to their own engagement and motivation? Third, what factors facilitate or hinder active participation in Informatics learning at the senior high school level? This study contributes qualitative descriptive evidence from a regional Indonesian context that is underrepresented in the existing literature on learning innovation and student participation and offers practical insights for Informatics teachers seeking to design more engaging and participatory learning environments within the Merdeka Belajar curriculum framework.

2. RESEARCH METHOD

2.1 Research Design

This study employed a qualitative descriptive research design, which aims to describe and interpret social phenomena as they naturally occur in a real-world setting without manipulation or experimental intervention(John W. Creswell & Timothy C. Guetterman, 2018). Qualitative descriptive design was selected over alternative qualitative approaches for three reasons. First, unlike phenomenology, which centers on the lived experience of a specific phenomenon as a consciousness-transforming event, this study sought a broader descriptive account of classroom practices and student responses across multiple interaction types. Second, unlike a case study, which requires a bounded system with multiple data sources examined over an extended period, this study focused on specific instructional practices within a single subject rather than a comprehensive institutional portrait. Third, unlike grounded theory, which aims to generate a new theoretical model through iterative sampling and constant comparison, this study sought to describe and interpret existing patterns of participation rather than build new theory. Qualitative descriptive design is therefore the most appropriate fit for the research aim of exploring how learning innovations are perceived and experienced by students and a teacher in a naturalistic Informatics classroom context. Data collection was conducted over six weeks during the second semester of the 2024/2025 academic year, from March to April 2025, encompassing the full instructional cycle for two Informatics topics: computational thinking and information system design.

2.2 Research Participants

Participants were selected through purposive sampling, a technique that prioritizes information richness over statistical representativeness and is widely adopted in qualitative educational research(John W. Creswell & Timothy C. Guetterman, 2018; Miles et al., 2014). The study involved eight participants in total. The student participants comprised seven Grade XI students from a single Informatics class at School X, a state senior high school in Sukoharjo, Central Java, Indonesia, during the 2024/2025 academic year. The group consisted of six female students and one male student, with a mean age of approximately 16.5 years. Students were selected based on two criteria: active enrollment in the Informatics subject during the study period, and willingness to participate, as confirmed through written consent from students and their guardians. The notable gender imbalance in the participant group reflects the actual composition of the class rather than a deliberate sampling choice; its potential influence on the perspectives expressed is acknowledged as a limitation and discussed further in the Limitations section. The participant was an experienced Informatics teacher with 8 years of senior high school teaching experience, responsible for delivering all Informatics instruction to the participating class during the study period.

The sample size of seven students and one teacher is intentionally modest and consistent with the principles of qualitative descriptive inquiry, in which depth of understanding takes precedence over breadth of representation(Miles et al., 2014). In qualitative research, purposive samples of this size are considered adequate when the aim is to capture contextually rich perspectives from a specific instructional setting rather than to produce statistically generalizable findings(John W. Creswell & Timothy C. Guetterman, 2018). Accordingly, all findings reported in this study should be interpreted strictly within the context of this classroom at School X and should not be generalized to all Informatics classes in Sukoharjo or to Indonesian senior high schools more broadly. Transferability of findings to similar contexts may nonetheless be possible when readers identify comparable conditions in their own settings.

2.3 Data Collection

Data was collected through three complementary methods, each targeting a distinct perspective on the research questions. First, a direct semi-structured interview was conducted with the Informatics teacher, lasting approximately 30 minutes. The interview comprised 12 questions covering instructional strategies, learning innovation approaches, and the teacher's assessment of student participation patterns (Table 1). With the teacher's consent, the interview was audio-recorded and subsequently transcribed verbatim to ensure accuracy of representation. Second, a written open-ended questionnaire was administered to the seven student participants, comprising 13 questions about their learning experiences, perceptions of instructional methods, and self-reported participation behaviors (Table 2). The written format was selected over oral interviews to reduce potential social desirability bias arising from peer presence during group interviews and to give students adequate time to reflect on and articulate their responses. Third, classroom observation was conducted across four sessions, each lasting approximately 80 minutes, corresponding to two full instructional cycles on computational thinking and information system design. Observations were guided by a structured observation checklist covering three dimensions: student verbal participation (questioning and discussion), student

behavioral engagement (attention and task involvement), and teacher instructional behaviors (method variation and student interaction frequency). Field notes were recorded during and immediately following each session to supplement checklist data.

To strengthen data credibility, triangulation was applied across all three data sources. Specifically, observational field notes provided real-time behavioral evidence of participation patterns; teacher interview data offered an instructional perspective on the factors shaping student engagement; and student questionnaire responses captured self-reported experiential perspectives. Convergences and divergences across these three sources were systematically examined during the analysis phase to produce a more complete and balanced account of learning innovation and student active participation in the observed classroom(John W. Creswell & Timothy C. Guetterman, 2018; Miles et al., 2014). Both the teacher interview guide and the student questionnaire were reviewed by two peers with expertise in qualitative educational research before data collection to ensure question clarity, logical sequencing, and alignment with the research questions.

Table 1 Teacher Semi-Structured Interview Guide

Administered in Indonesian via direct semi-structured interview with the Informatics teacher (approx. 30 min, audio-recorded). The interview covers instructional innovation, participation facilitation, and teacher-student interaction.

No.	Dimension	Interview Question
1	**Instructional Methods**	How would you describe the teaching methods you employ in the Informatics class?
2	**Challenges**	What challenges do you encounter in teaching Informatics in your class?
3	**Student Interest**	In your view, what factors make students interested or disinterested in Informatics?
4	**Participation Observation**	Do you observe differences in active participation between students who are interested in Informatics and those who are not?
5	**Encouraging Participation**	How do you encourage students to ask questions and participate actively in class discussions?
6	**Responding to Passivity**	What do you do when a student does not participate in discussions or is reluctant to ask questions during Informatics lessons?
7	**Group Discussion**	In your view, how important is group discussion for increasing student participation in Informatics?
8	**Interest–Participation Link**	How do you see the relationship between students' interest in Informatics and their level of class participation?
9	**Method–Motivation Link**	Do you feel that the teaching methods you apply directly affect students' motivation to participate? Why?
10	**Practical Tasks**	How do you view the role of practical tasks in increasing students' interest and participation?
11	**Improvement Strategies**	What steps do you think need to be taken to improve students' interest and participation in Informatics learning?
12	**Effective Practices**	In your view, what has been working well in Informatics teaching in your class?

Alignment with Research Questions
RQ1 (learning innovations implemented) → Q1, Q2, Q5, Q9, Q10, Q11, Q12
RQ2 (student perception and response) → Q3, Q4, Q7, Q8
RQ3 (facilitating/hindering factors) → Q2, Q6, Q9, Q11

Table 2 Student Written Open-Ended Questionnaire

Administered in Indonesian as a written questionnaire to seven Grade XI students (S1–S7). 13 open-ended items covering engagement, instructional perception, participation behavior, and interest–participation relationship.

Theme Key	**Theme 1 Practical** & Lab Activities | Theme **2 Teacher** Instructional Style | **Theme 3 Individual** Variation & Language Barrier		
No.	**Dimension**	**Theme**	**Questionnaire Item**
1	**Subject Interest**	**Theme 1**	Do you feel interested in the subject of Informatics? Why?
2	**Teacher Perception**	**Theme 2**	What is your view of the teacher's instructional methods in the Informatics class?
3	**Engagement Triggers**	**Theme 1**	Is there anything specific in Informatics that makes you more enthusiastic about learning?
4	**Practical Tasks**	**Theme 1**	Do you think practical tasks make lessons more interesting?
5	**Environmental Support**	**Theme 2**	Do you feel supported by your environment (peers, teachers) to become more engaged in learning Informatics?
6	**Questioning Behavior**	**Theme 2**	Do you often ask the teacher questions in class? Why?
7	**Group Contribution**	**Theme 1**	How do you typically contribute to group discussions?
8	**Task Completion**	**Theme 3**	Do you always complete assigned tasks on time? Why?
9	**Peer Assistance**	**Theme 3**	Have you ever helped a classmate understand the material? Please describe your experience.
10	**Participation Drivers**	**Theme 1**	What usually makes you more active in Informatics class?
11	**Method–Motivation Link**	**Theme 2**	Does the teacher's instructional method affect your motivation to participate? Why does this happen?
12	**Interest–Participation Link**	**Theme 3**	In your view, is there a relationship between your interest in Informatics and your activity level in class? Please explain.

13	**Material Attractiveness**	**Theme 3**	Do you feel more active in class when the material being taught is interesting?

Alignment with Research Questions
RQ1 (learning innovations implemented) → Q1, Q2, Q3, Q4, Q10
RQ2 (student perception and response) → Q2, Q5, Q6, Q7, Q11, Q13
RQ3 (facilitating/hindering factors) → Q1, Q5, Q8, Q9, Q12

2.4. Data analysis

Data analysis followed the three-stage interactive model proposed by(Miles et al., 2014), comprising data reduction, data display, and conclusion drawing. Each stage was applied iteratively across all three data sources, namely observational field notes, teacher interview transcripts, and student written questionnaire responses, to produce a coherent and well-grounded thematic account of the research questions. In the data reduction stage, all raw data were first prepared for analysis. Audio recordings of the teacher interview were transcribed verbatim. Student questionnaire responses, already in written form, were compiled and organized by question item to facilitate cross-participant comparison. Observational field notes were reviewed and annotated with initial descriptive labels. Following preparation, open coding was applied independently to each data source, in which meaningful segments of text were assigned descriptive labels reflecting their content. Codes were kept close to the data at this stage without premature interpretation, following the principle of descriptive coding advocated(Saldana, 2021). In the data display stage, initial codes were grouped and compared across data sources to identify patterns and recurring ideas. Related codes were clustered into candidate themes, which were then mapped visually to examine their internal coherence and their relationships with one another. Theme labels were assigned to reflect the essence of each cluster in terms that connected directly to the research questions. Three overarching themes emerged from this process, as reported in the Results section.

In the conclusion drawing stage, themes were interpreted in relation to the research questions and situated within the theoretical frameworks of constructivism and active learning. Preliminary interpretations were reviewed against the raw data to ensure that conclusions were grounded in evidence rather than researcher assumption. To strengthen the credibility and trustworthiness of the analysis, four verification procedures were applied(Ahmed, 2024). First, data triangulation was conducted systematically comparing findings across the three data sources and noting both convergences and divergences. Second, member checking was carried out by presenting a summary of the preliminary themes to the teacher participant, who confirmed that the themes accurately reflected the instructional experiences described during the interview. Third, peer debriefing was conducted with a colleague experienced in qualitative educational research, who reviewed the coding scheme and raised clarifying questions that refined the theme definitions. Fourth, a reflexivity journal was maintained throughout the analysis process to document the researcher's interpretive decisions and manage potential bias arising from the researcher's dual role as PPL teacher and investigator at the same school.

2.5 Ethical Considerations

This study was conducted in accordance with the ethical principles governing research involving human participants, with particular attention to the involvement of minor students under the age of 18. Before data collection, institutional permission was obtained from the principal of School X, who reviewed and approved the research protocol, including the data collection instruments and the intended use of findings for academic publication. Ethical approval was additionally sought from the research ethics oversight committee at Universitas Sebelas Maret in accordance with institutional requirements for student research involving school participants.

Informed consent was obtained at two levels. At the guardian level, written consent forms were distributed to the parents or legal guardians of all seven student participants, explaining the purpose of the study, the nature of participation, the types of data to be collected, and the intended use of findings. Guardians were informed that participation was entirely voluntary and that withdrawal at any time would carry no academic or social consequences for their child. At the student level, assent was additionally obtained directly from each student participant, who was given an age-appropriate explanation of the study before agreeing to take part. The teacher participant provided independent written consent before the interview. All data were handled with strict

confidentiality. Student participants are referred to throughout this article using anonymous codes (Student 1 through Student 7), and the teacher participant is referred to as Teacher 1. The school is identified only as School X. These codes do not correspond to any identifiable personal information, such as name, class rank, or seat number. All raw data, including interview transcripts and written questionnaire responses, are stored in a password-protected file accessible only to the research team and will be destroyed following the publication of this article in accordance with data retention guidelines.

One student response originally collected during data collection contained a remark directed at the researcher in their capacity as a PPL teacher at the school. This remark was reviewed during the analysis phase and determined to carry potential identification risk for the student if published verbatim. Accordingly, it was removed from the published data tables and replaced with a notation indicating that the response was withheld to protect participant privacy. This decision was documented in the researcher's reflexivity journal and is consistent with the principle of minimizing harm to participants(Ahmed, 2024). The researcher's dual role as PPL teacher and researcher at School X is acknowledged as a potential source of relational influence on participant responses. To mitigate this, students were explicitly informed that their responses would have no bearing on their grades or standing in the class, and that the researcher's role during the study was solely that of a researcher rather than an evaluating teacher. This assurance was reiterated at the beginning of each data collection session.

3. RESULT AND ANALYSIS

Thematic analysis of observational field notes, teacher interview transcripts, and student-written questionnaire responses yielded three overarching themes that address the research questions(Virginia Braun & Victoria Clarke, 2022). Raw data supporting these themes are presented in full in Appendix A for transparency and audit trail purposes. Representative quotations included below have been translated from Indonesian and lightly edited for grammatical clarity while preserving the original meaning.

3.1 Theme 1: Practical and Laboratory-Based Activities as Primary Participation Catalysts

The most consistently recurring pattern across all three data sources was students' heightened engagement during hands-on, laboratory-based sessions compared to theory-focused lessons. Six of seven students explicitly identified practical activities as the primary condition under which they felt motivated to participate actively. This convergence across independent data sources, namely observational records, student self-reports, and teacher assessments, provides strong triangulated support for this theme. Representative student responses illustrate this pattern clearly. Student 2 stated that participation increased during laboratory sessions because tasks required direct action rather than passive reception of information. Student 4 expressed that working directly with computers gave a sense of accomplishment that theory lessons did not provide. Student 6 noted that practical tasks made it easier to ask questions because the problems encountered were concrete and immediately visible rather than abstract.

Observational field notes corroborate these self-reports. During the computational thinking session conducted in the computer laboratory, verbal participation rates, measured as the frequency of student-initiated questions and contributions to discussion, were noticeably higher than during the preceding theory session in the regular classroom. Students who remained silent during the theory session were observed asking, clarifying questions, and requesting peer assistance during the practical session. From the teacher's perspective, the practical format created conditions that naturally demanded participation: "When students are working on a task in front of the computer, they cannot simply remain passive. The task requires them to do something, and when they encounter difficulty, they ask. That question is participation" (Teacher 1, interview). This finding aligns with constructivist learning theory, which holds that learners construct knowledge most effectively through active engagement with concrete problems rather than passive reception of abstract content(Vygotsky, 1978). It also resonates with Rehman et al.'s (2024) finding that project-based and hands-on learning approaches produce significant enhancement in student engagement and collaborative problem-solving in high school settings.

3.2 Theme 2: Teacher Instructional Style as Motivational Scaffold for Participation

The second theme concerns the direct influence of teacher instructional behavior on students' willingness to participate. Data across all three sources consistently indicated that the way the teacher delivered instruction, managed classroom interaction, and responded to student contributions functioned as a motivational scaffold

that either facilitated or constrained active participation. Students distinguished clearly between instructional moments that invited participation and those that discouraged it. Student 3 noted that when the teacher explained using relatable examples and invited responses rather than directing questions exclusively at specific individuals, the classroom atmosphere felt safer for volunteering answers. Student 5, who self-identified as having low interest in Informatics due to the subject's reliance on English-language materials, nevertheless reported higher participation during sessions in which the teacher provided Indonesian-language explanations alongside English terminology, suggesting that linguistic accessibility mediated engagement independently of subject interest. Student 7 described the teacher's use of direct encouragement, specifically being called upon by name to contribute, as a decisive factor in overcoming reluctance to speak.

The teacher's own account reflected awareness of this dynamic: "I try not to let the same students answer every time. If I only call on the confident ones, the others stop listening because they know they will not be asked. Rotation matters" (Teacher 1, interview). Observational data supported this self-report. The teacher was consistently observed distributing questions across different students during discussion phases and responding to incorrect answers with elaboration rather than correction, a practice associated with psychologically safe learning environments(Arung et al., 2023). This theme is theoretically grounded in Vygotsky (1978) concept of the Zone of Proximal Development, wherein the teacher functions as a more knowledgeable other who scaffolds learners toward competencies they cannot yet achieve independently. The teacher's active management of participation distribution and linguistic accessibility represents a practical operationalization of this scaffolding role in the Informatics classroom context.

3.3 Theme 3: Individual Interest Variation and the English Language Barrier as Participation Moderators

The third theme addresses the heterogeneity of student participation that persisted even within the same instructional conditions, revealing that individual interest levels and linguistic accessibility moderated the effect of learning innovations on participation. While Themes 1 and 2 describe conditions under which participation increased at the group level, this theme captures the individual-level variation that complicates a simple cause-and-effect interpretation. Five of seven students reported moderate to high interest in Informatics, citing computational problem-solving and technology use as intrinsically motivating. However, two students reported lower baseline motivation. Student 1 expressed that certain theoretical topics felt disconnected from practical applications they could imagine using. Most notably, Student 5 identified the use of English in textbooks and some instructional materials as a significant barrier: "I am less interested because I am not good at English and the Informatics subject often uses English, which makes it harder for me to understand and participate" (Student 5, written response, translated).

This finding is significant because it reveals a dimension of participation inequality that is not addressed by the learning innovations currently implemented. Interactive methods and teacher scaffolding improved engagement for students who were already linguistically equipped to access the content, but the same innovations did not equally benefit students for whom the language of instruction itself was an obstacle. Toma et al (2023) Note that effective ICT integration must account for students' varying capacities to engage with digitally mediated content, a principle that extends here to linguistic mediation of digital learning materials.
Observational notes recorded that Student 5 was among the least verbally active across all four sessions, consistent with the self-reported linguistic barrier. This convergence between self-report and behavioral observation strengthens the credibility of this finding and underscores the need for differentiated instructional approaches that address linguistic accessibility alongside methodological innovation.

School records provided by the class teacher indicated that the seven student participants achieved Informatics grades ranging from 89 to 95 at the end of the observed instructional period, with a group mean of 92 out of 100. These records were accessed with the permission of the school administration and the teacher as supplementary contextual information rather than as a primary data source. While a positive association between observed participation levels and academic achievement was noted during analysis, in that students who demonstrated more frequent verbal contributions and task engagement also tended to appear in the higher grade range, this qualitative descriptive study does not claim causal attribution between learning innovation implementation and grade outcomes. Such a claim would require a controlled experimental or correlational design with pre-post measurement, which falls outside the scope and purpose of the present inquiry. The grade data are therefore presented solely as contextual background that characterizes the academic profile of the

participant group, not as evidence that learning innovations caused or directly produced the observed achievement levels.

3.4 Theoretical Analysis of Emerging Themes

The three themes identified in this study converge around a coherent theoretical account of why and how learning innovations promote active student participation in the observed Informatics classroom. This section situates each theme within established theoretical frameworks to move beyond descriptive summary toward interpretive explanation.

3.4.1 Interactivity and Practical Engagement: A Constructivist Interpretation

The dominance of practical, laboratory-based activities as participation catalysts (Theme 1) is most directly explained by constructivist learning theory, which holds that knowledge is actively constructed by learners through direct engagement with meaningful tasks rather than passively received through transmission(Piaget, 1952; Vygotsky, 1978). In the observed classroom, hands-on computer tasks created conditions that made passive participation structurally impossible: students were required to act, encounter problems, and seek solutions, thereby generating the cognitive activation that constructivism identifies as the precondition for learning. This is consistent with Toma et al (2023) finding that ICT integration creates interactive learning environments that increase student engagement precisely because they require active rather than receptive cognitive processing. The contrast students articulated between theory sessions and practical sessions mirrors the distinction constructivist theory draws between inert knowledge transmitted verbally and operative knowledge constructed through action. Critically, the data suggest that it is not technology per se that drives participation, but the hands-on, problem-encountering structure that practical technology use affords, a distinction with direct implications for instructional design.

3.4.2 Teacher Instructional Style: Self-Determination Theory and the Role of Autonomy Support

The influence of teacher instructional style on student motivation to participate (Theme 2) is illuminated by Self-Determination Theory (SDT), which proposes that human motivation is sustained when three basic psychological needs are met: autonomy, competence, and relatedness(Deci & Ryan, 2000). In the observed classroom, the teacher's practices of distributing questions across all students, using elaboration rather than correction in response to errors, and providing Indonesian-language scaffolding alongside English content addressed all three needs simultaneously. Distributing participation opportunities supported autonomy by reducing the social risk of voluntary contribution. Responding to errors with elaboration rather than correction supported competence by protecting students' sense of academic self-efficacy. Providing linguistic scaffolding supported relatedness by signaling that the teacher recognized and accommodated students' individual linguistic contexts. Rehman et al. (2024) similarly found that teacher facilitation behaviors are among the strongest predictors of student engagement in project-based learning environments, a finding that converges with the present data and suggests that instructional style is not merely a pedagogical preference but a psychologically consequential variable in participation outcomes.

3.4.3 Individual Variation and the English Language Barrier: Implications for Differentiated Instruction

The persistence of participation inequality despite positive overall engagement levels (Theme 3) is not fully explained by constructivism or SDT alone, as both frameworks predict broadly positive outcomes from interactive methods without accounting for the moderating role of linguistic access(Ramirez et al., 2025; Xia et al., 2025). The data from Student 5 introduces an important boundary condition: learning innovations that are designed around digital interactivity and teacher scaffolding may fail to reach students for whom the language of instructional content itself constitutes a barrier before any methodological consideration. This finding resonates with Cummins (2000), The distinction between Basic Interpersonal Communicative Skills and Cognitive Academic Language Proficiency holds that students may function adequately in social interaction but encounter significant difficulty with academically demanding subject-specific language. In the Informatics context, where technical vocabulary is predominantly English-derived, and textbooks are frequently in English, students with lower English proficiency face a dual burden that interactive methods do not automatically resolve. (Arung et al., 2023), surveying 1,935 teachers and students across Jakarta secondary schools, similarly identified language accessibility as an under-addressed dimension of the Merdeka Belajar implementation challenge. The implication for practice is that learning innovation in Informatics must

incorporate explicit linguistic scaffolding, such as bilingual glossaries, translated task instructions, and teacher code-switching, as a component of participation design rather than an afterthought.

4. CONCLUSION

4.1 Summary of Findings

This qualitative descriptive study explored how learning innovations implemented by an Informatics teacher were experienced and perceived by students in relation to their active participation in learning at a senior high school in Sukoharjo. Thematic analysis of data from three complementary sources, namely classroom observation, a semi-structured teacher interview, and written open-ended questionnaires from seven student participants, yielded three key themes. First, practical and laboratory-based activities functioned as the primary catalysts for student active participation, with six of seven students reporting substantially higher engagement during hands-on sessions than during theory-based instruction. Second, teacher instructional style, particularly the distribution of participation opportunities across all students, the use of elaboration rather than correction in response to errors, and the provision of linguistic scaffolding alongside English-language content, functioned as a motivational scaffold that directly shaped students' willingness to contribute verbally and engage with tasks. Third, individual variation in subject interest and English language proficiency moderated participation levels even within the same instructional conditions, with one student identifying the English-language nature of Informatics materials as a significant barrier to engagement that interactive methods alone did not overcome. Together, these three themes suggest that learning innovations promote active participation most effectively when they combine hands-on task design, responsive teacher facilitation, and linguistic accessibility as integrated rather than independent components of instructional planning.

4.2 Theoretical and Practical Implications

Theoretically, these findings extend the application of constructivist learning theory and Self-Determination Theory to the specific context of Informatics education in Indonesian senior high schools, a setting that has received limited attention in the existing qualitative literature. The data support Vygotsky's (1978) proposition that social interaction and scaffolded task engagement are fundamental conditions for learning, and align with Deci and Ryan's (2000) identification of autonomy support, competence affirmation, and relatedness as the psychological mechanisms through which teacher behavior sustains student motivation. The emergence of the English language barrier as a participation moderator additionally contributes a linguistic dimension to the understanding of student engagement in technology-heavy subjects, extending Cummins's (2000) A framework for cognitive academic language proficiency in the Informatics classroom context. Practically, Informatics teachers at the senior high school level are encouraged to prioritize laboratory-based and project-oriented instructional formats over purely lecture-based delivery, to develop systematic strategies for distributing participation equitably across all students including those who are less verbally confident, and to integrate explicit bilingual support mechanisms, such as translated task instructions, Indonesian-language glossaries for technical terms, and strategic code-switching, into standard instructional practice rather than treating linguistic accessibility as a supplementary concern. School administrators and curriculum developers working within the Merdeka Belajar framework may draw on these findings to support teachers in designing Informatics learning experiences that address participation equity alongside computational skill development.

4.3 Limitations and Future Research

This study has several limitations that should be considered when interpreting its findings. First, the sample comprised seven students from a single classroom at one school in Sukoharjo, which constrains the transferability of findings to other Informatics classrooms, schools, or regional contexts. Second, the significant gender imbalance in the student participant group, six females and one male, may have influenced the perspectives expressed and does not reflect the full range of experiences across mixed-gender Informatics classrooms. Third, data collection was conducted over six weeks, which, while sufficient for thematic saturation within this specific context, does not capture how participation patterns might evolve across a full academic year or across different instructional topics. Fourth, the researcher's dual role as PPL teacher and investigator at the school introduced a relational dynamic that, despite mitigation through reflexivity, journaling, and member checking, may have influenced how students articulated their responses. Fifth, the English language barrier identified in Theme 3 was reported by one student and observed behaviorally, but was not measured through any formal linguistic proficiency instrument, limiting the precision of claims about its extent and impact. Future research should address these limitations by conducting multi-school comparative

studies across diverse regional contexts in Indonesia, employing mixed-methods designs that combine qualitative exploration with standardized measures of participation frequency and linguistic proficiency, extending observation periods to capture longitudinal changes in participation behavior, and examining the specific design features of bilingual instructional scaffolding that most effectively support participation among Informatics students with varying English proficiency levels.

REFERENCES

Ahmed, S. K. (2024). The pillars of trustworthiness in qualitative research. *Journal of Medicine, Surgery, and Public Health*, *2*, 100051. https://doi.org/10.1016/J.GLMEDI.2024.100051

Arung, F., Murthado, F., & Boeriswati, E. (2023). Merdeka Belajar: the Real Learning Needs of Students, Teachers, and Institutions Related to Demands for Independent Learning Innovation. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, *5*(2), 120–135. https://doi.org/10.23917/IJOLAE.V5I2.20370

Asadpour, M., Bakhshi, M. H., Mirzapour, P., & Shahabi, M. (2025). The motivational role of teachers: A systematic review of key factors influencing students' academic motivation. *European Journal of Psychology of Education*, *40*(4), 133-. https://doi.org/10.1007/S10212-025-01039-0/TABLES/3

Bannus, D. A., & Emeral, E. (2025). Indonesian EFL Teachers' Challenges: Integrating ICT in EFL Teaching. *EBONY: Journal of English Language Teaching, Linguistics, and Literature*, *5*(2), 195–212. https://doi.org/10.37304/EBONY.V5I2.18789

Cabalbag, J. R. (2025). Technology integration: impact to students' learning engagement in higher education institutions. *Cogent Education*, *12*(1). https://doi.org/10.1080/2331186X.2025.2581410

Cummins, J. (2000). Language, Power and Pedagogy: Bilingual Children in the Crossfire. In *Language, Power and Pedagogy*. Multilingual Matters. https://doi.org/10.2307/JJ.27195459

Deci, E. L., & Ryan, R. M. (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry*, *11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Díaz-Lauzurica, B., & Moreno-Salinas, D. (2025). Active Learning Methodologies for Increasing the Interest and Engagement in Computer Science Subjects in Vocational Education and Training. *Education Sciences 2025, Vol. 15, Page 1017*, *15*(8), 1017. https://doi.org/10.3390/EDUCSCI15081017

Flogie, A., Lipovec, A., & Škrobar, J. (2025). Integrating Computer Science and Informatics Education in Primary Schools: Insights from a Slovenian Professional Development Initiative. *Sustainability 2025, Vol. 17, Page 9068*, *17*(20), 9068. https://doi.org/10.3390/SU17209068

John W. Creswell, & Timothy C. Guetterman. (2018). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (Sixth edition). Pearson Education, Inc.

Kurniawan, S., & Maryani, I. (2025). Primary School Teachers' Technology Readiness for Artificial Intelligence Integration in Science Learning in Indonesia. *Journal of Educational Technology Innovation and Applications*, *1*(02), 69–77. https://doi.org/10.56741/jetia.v1i02.1111

Maulidia, D., Winarno, N., Hasanah, L., & Syifa, M. (2025). Enhancing Computational Thinking and Learning Engagement through STEM-based Water Turbine Project. *Tarbiyah : Jurnal Ilmiah Kependidikan*, *14*(2), 281–301. https://doi.org/10.18592/TARBIYAH.V14I2.16029

Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative Data Analysis: A Methods Sourcebook* (Third). SAGE Publications.

Ngoc, T., Nguyen, T., Duong, &, Oanh, T. K., Thi, D., & Oanh, K. (2025). Cooperative learning and its influences on student engagement. *Cogent Education*, *12*(1). https://doi.org/10.1080/2331186X.2025.2513414

OECD. (2023). PISA 2022 Results (Volume I): The State of Learning and Equity in Education. *PISA, PISA*. https://doi.org/10.1787/53F23881-EN

Piaget, J. (1952). *Origins of Intelligence in Children*. International Universities Press. https://books.google.com/books/about/The_Origins_of_Intelligence_in_Children.html?hl=id&id=H7MkAQAAMAAJ

Ramirez, K. B. C., Ong, A. K. S., & Tablan, J. P. (2025). Analysis of architect profession career pursuance intention among Filipinos: A TPB-SDT approach under public and private educational administration. *Acta Psychologica*, *258*, 105286. https://doi.org/https://doi.org/10.1016/j.actpsy.2025.105286

Rasyid, M. Al, & Khoirunnisa, F. (2021). The Effect Of Project-Based Learning On Collaboration Skills Of High School Students. *Jurnal Pendidikan Sains Universitas Muhammadiyah Semarang*, *9*(1), 113–119. https://doi.org/10.26714/JPS.9.1.2021.113-119

Rehman, N., Huang, X., Mahmood, A., & ALGerafi, M. A. M. (2024). Project-based learning as a catalyst for 21st-Century skills and student engagement in the math classroom. *Heliyon*, *10*.

Rohana, S., Irianto, A., & Rachmadtullah, R. (2023). Project Based Learning Model on Critical Thinking Ability Seen from Cognitive Style in Elementary Schools. *Journal of Education and Teacher Training Innovation*, *1*(1), 24–34. https://doi.org/10.61227/JETTI.V1I1.10

Saldana, J. (2021). *The coding manual for qualitative researchers*. Sage Publishing.

Setyo Anggraini, E., Yudha Kristiawan, D., & Rahman, A. (2025). Exploring Students' English Vocabulary Learning Experiences in Merdeka Belajar Curriculum: The Case Of Vocational High School In Indonesia. *ELITERATE : Journal of English Linguistics and Literature Studies*, *4*(3), 2025.

Syahroni, A. I. (2025). Teachers' Challenges and Strategies of Project-Based Learning Due to Limited Time for Mentoring Speaking Ability. *Pioneer: Journal of Language and Literature*, *17*(1), 154–170. https://doi.org/10.36841/PIONEER.V17I1.6099

Toma, F., Ardelean, A., Grădinaru, C., Nedelea, A., & Diaconu, D. C. (2023). Effects of ICT Integration in Teaching Using Learning Activities. *Sustainability 2023, Vol. 15, Page 6885*, *15*(8), 6885. https://doi.org/10.3390/SU15086885

Virginia Braun, & Victoria Clarke. (2022). Thematic Analysis, A practical Guide. In *SAGE Publications Ltd* (Number 2). Sage Publications Ltd. https://uk.sagepub.com/en-gb/eur/thematic-analysis/book248481?page=1

Vygotsky, L. S. (1978). *Mind in Society The Development of Higher Psychological Processes* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.). the President and Fellows of Harvard College. https://doi.org/10.4244/EIJY14M06_06

Xia, T., Pan, X., Cao, M., & Guo, J. (2025). An investigation of college students' acceptance of AI-assisted reading tools: An expansion of the TAM and SDT. *Education and Information Technologies*, *30*(13), 18031–18058. https://doi.org/10.1007/s10639-025-13491-y

Xu, F., Wang, L., & Xu, J. (2025). The impact of teachers' motivating style and student-teacher relationships on adolescents' class participation: The indirect role of learning motivation. *Acta Psychologica*, *257*, 105105. https://doi.org/10.1016/J.ACTPSY.2025.105105

Yuniwati, I., & Sitepu, E. (2025). The effectiveness of project-based learning in developing the 21st century skills. *Darussalam: Journal of Psychology and Educational*, *4*(1), 35–50. https://doi.org/10.70363/DJPE.V4I1.272

APPENDIX A — Student Written Questionnaire: Complete Response Data (English Translation)

Seven Grade XI students (S1–S7) | School X, Sukoharjo, Central Java, Indonesia | March–April 2025 | n = 7
Responses translated from Indonesian. One response withheld (Q11/S1) per ethical guidelines (Section 2.5). Responses lightly condensed for readability while preserving substantive meaning.

Theme Key		**Theme 1** Practical & Laboratory Activities as Participation Catalysts Q1, Q3, Q4, Q7, Q10	**Theme 2** Teacher Instructional Style as Motivational Scaffold Q2, Q5, Q6, Q11		**Theme 3** Individual Interest Variation & English Language Barrier Q8, Q9, Q12, Q13				
Q	**Theme**	**Question**	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**
Q1	**Theme 1**	Do you feel interested in the subject of Informatics? Why?	Yes. Informatics offers opportunities to understand the technology we use every day. It also broadens the perspective on how to solve problems using logic and creativity.	Yes, because I enjoy working with computers.	Yes. Informatics is highly relevant to current technological development. It opens opportunities to understand how computers work, create programs, and solve problems through logic and creativity. It also teaches valuable future skills such as coding, data analysis, and digital security. It is exciting to be able to create	Yes, somewhat — because it is enjoyable when practiced.	Less interested, because I do not particularly like computer-related material, and Informatics often uses English, which I am not proficient in. **Key Theme 3: English language barrier**	Yes, because practical sessions are enjoyable.	Yes, because I enjoy going to the computer laboratory for practice.

					something others can use, like an app or a game.				
Q2	**Theme 2**	How do you perceive the teacher's instructional methods in the Informatics class?	It varies. When the teacher uses interactive methods such as discussion, direct practice, or projects, the lesson becomes more engaging. However, if it is only theory, it can feel boring.	The teacher speaks quickly but is patient.	The teacher's instructional method greatly influences student interest. Teachers who are interactive and use practical methods — such as direct projects or simulations — are usually more engaging. Overly long theoretical explanations without practice often make students bored, especially in a technology-based subject like this.	The teaching style is fairly enjoyable.	The teacher's way of explaining is somewhat easy to understand.	Slightly confusing at times, but still comprehensible.	Good — the lessons are understandable and sink in.
Q3	**Theme 1**	Is there anything specific in Informatics that makes you more enthusiastic about learning?	Learning programming, creating simple applications, and seeing the immediate output of code I write. Topics such as	Yes — learning about computers and getting to know the names of computer	The opportunity to create something real. For example, when learning coding, I can build a simple program such as a small game or	Yes, there is.	Yes — although I am not fond of Informatics overall, I do enjoy working with Microsoft Word.	Not particularly.	Yes — practical sessions in the computer laboratory.

			artificial intelligence or game development are also very appealing.	hardware components.	application. It is satisfying to see something I built work as intended.				
Q4	**Theme 1**	Do you think practical tasks make lessons more interesting?	Yes. Practical tasks are very helpful because I can directly apply the theory I have learned. They also help me understand concepts more deeply.	Yes.	Yes. Practical tasks make lessons more engaging, especially in Informatics. With practice, students not only understand theory but also immediately see how concepts are applied. This provides a more enjoyable and interactive learning experience.	Yes.	Yes.	Yes.	Yes.
Q5	**Theme 2**	Do you feel supported by your environment (peers, teachers) to become more engaged in learning Informatics?	Mostly yes, especially when the teacher provides encouragement and peers help each other understand the material. A	In principle, yes, but I do not have a computer or laptop at home, so I can only practice Informatics in	The environment greatly influences my motivation to learn. When peers and the teacher are supportive, I feel more motivated. Peer collaboration during group work	Sometimes yes, sometimes no — it depends on people's attitudes and personalities.	Yes.	Yes.	Yes.

			collaborative environment is very motivating.	the school's computer laboratory.	introduces new ideas, and a patient teacher who gives positive feedback makes me more confident.				
Q6	**Theme 2**	Do you often ask the teacher questions in class? Why?	Not always. I usually ask when I do not understand something or when the topic interests me. Sometimes I hesitate because I worry my question will be considered trivial.	No.	Yes, I often ask questions — especially when a concept is unclear, or I want to understand it more deeply. I believe asking is the best way to learn.	Occasionally, not frequently. If I do not understand something, I will ask the teacher directly.	Rarely — I prefer asking peers instead.	No.	No, because I lack self-confidence.
Q7	**Theme 1**	How do you typically contribute to group discussions?	I try to be active by offering ideas or solutions, especially when I understand the material. If I am less sure, I listen first and then contribute based on my understanding.	I joined in and actively helped search for answers.	I share ideas, listen to others before responding, take on tasks suited to my strengths (such as making presentations or coding), and try to keep the discussion atmosphere	Honestly, I prefer working independently. Group members are sometimes hard to coordinate, so I often end up handling most	I offer opinions and suggestions.	I contribute by providing my opinion and answers.	Working together and discussing as a group.

					positive by encouraging quieter members to contribute.	of the tasks myself.			
Q8	**Theme 3**	Do you always complete assigned tasks on time? Why?	Mostly yes, because I do not want tasks to pile up. Occasionally, I am late when a task is difficult, or I have other competing commitments.	Yes, because the teacher waits for submissions, and I want to finish quickly.	I try to always submit on time to avoid stress, show respect for the teacher's effort, and leave time for revision. Occasionally, I am late when tasks accumulate, or I do not fully understand the material, in which case I ask for clarification or extra time.	Yes — I want to be free of the burden of tasks as quickly as possible, so I work on them immediately.	Yes, because I am afraid the teacher will reprimand me if the work is unfinished.	Yes, because I am afraid the task will be asked about or collected right at the deadline.	Not always — I sometimes forget.
Q9	**Theme 3**	Have you ever helped a classmate understand the material? Please describe your experience.	Yes. I once helped a friend understand simple programming concepts, such as how to write an if-else logic structure. I explained the steps using examples, and	Yes — I taught a friend how to type and centre-align text in Excel because they could not figure out how to centre it.	Yes — I explained the material until my friend fully understood it.	Yes. The teacher was presenting material on binary and decimal numbers. I already understood it, and when no one volunteered to	Yes — I helped a friend who did not understand the material by explaining it slowly and gradually so they could follow along.	Yes — I helped a friend understand how to convert decimal numbers to binary. I had initially forgotten the method but remembered again after	No.

			my friend was eventually able to complete the task.			solve a problem on the board, I went up. Afterwards, several friends asked me to explain the method, and I did so in my own words to make it easier to understand.		reviewing my notes and looking up examples, then I taught my friend.	
Q10	**Theme 1**	What usually makes you more active in the Informatics class?	I am more active when the material is practical in nature, such as coding or group projects. Support from the teacher and peers also makes the learning atmosphere more enjoyable.	The computer.	Exploring new topics in greater depth.	The chapter or material being taught. Not all chapters are easy for me to understand; when a chapter feels manageable, I become more active during that lesson.	Computer practice sessions.	Understanding the material makes me more active.	Practical sessions in the computer laboratory.
Q11	**Theme 2**	Does the teacher's instructional method affect your motivation to participate? Why does this happen?	[Response partially withheld to protect participant privacy in	Yes, because the teacher plays a very important role.	Yes, that is correct.	Yes, because how the teacher explains directly affects how	Yes — when the learning atmosphere feels relaxed and not tense, I become more	Yes, very much so — when the teacher's method is distinctive and enjoyable, it	Yes — when the teaching method is unclear, students find it difficult to

			accordance with ethical guidelines — see Section 2.5. The substantive content confirmed that interactive and discussion-based methods increase motivation to participate, while monotonous lecture-only delivery reduces enthusiasm and engagement.]			students receive and understand the content. If the teaching approach is not well-suited, students will struggle to grasp the material.	confident and enthusiastic about participating.	makes me more enthusiastic and engaged in the lesson.	understand the material and lose interest in the teacher.
Q12	**Theme 3**	In your view, is there a relationship between your interest in Informatics and your activity level in class? Please explain.	Yes, there is a relationship. When I genuinely like the topic, I ask more questions, join discussions, and try things on my own. When the material does not match my interests, I tend to be passive and just follow along	Yes — [response unclear; off-topic content omitted].	Yes, I enjoy it.	No. My level of classroom activity does not affect my interest in Informatics. Once I am interested in something, I remain interested. The environment has more influence on	Possibly — having a high level of interest can motivate one to become more active.	No relationship.	No.

			without enthusiasm.			me than my activity level in class.			
Q13	**Theme 3**	Do you feel more active in class when the material being taught is interesting?	When the material is interesting, I become more active. Material that is thought-provoking or relevant to everyday life usually helps me focus more and want to learn more. The main factor, in my view, is a combination of teaching method and how engaging the material is.	I feel more active when the session is in the laboratory.	Yes.	Yes — interesting and easy to understand, both of those matter to me.	Yes.	Possibly yes.	Yes.

Notes

1. All responses were originally collected in Indonesian and translated by the researcher. The translation aim is to preserve meaning and tone while ensuring readability in English.
2. Responses have been lightly condensed where necessary to improve conciseness. Full original-language transcripts are available from the corresponding author upon reasonable request.
3. Q1 / S5 (highlighted in red): This response represents the key data excerpt for Theme 3, specifically the English language barrier as a moderator of participation.
4. Q11 / S1 (highlighted in amber): The original response contained a remark directed at the researcher in their capacity as PPL teacher at the same school. This portion was withheld by ethical guidelines (Section 2.5). The substantive finding — that interactive methods increase, and monotonous methods decrease motivation to participate — is retained in the summary above.

5. Q12 / S2: The response to this question was off topic (referencing a physical activity unrelated to the question). It has been noted as unclear and the off-topic content has been omitted.