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Clarity of read outline discussion evaluation models to improve students' communication skills

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Abstract

The Read Outline Discussion Evaluation (RODE) learning model is designed to improve students' communication skills. This study aims to assess the validity and reliability of the RODE learning model with the Read, Outline, Discussion, and Evaluation (RODE) syntax. Three education experts evaluated learning materials to assess the validity and reliability of the RODE learning models. The RODE learning model validation sheet was filled out by experts who review and appraise the researcher's learning model. The three experts reviewed the hypothetical draft model and assessed it on the validation assessment sheet according to the guidelines of the validation instrument. The validity and reliability of the RODE Learning model were determined using a qualitative descriptive technique and Cronbach's alpha coefficient. The findings revealed that the RODE Learning model satisfied the validity and reliability standards. Therefore, the Read Outline Discussion Evaluation is a valid and reliable learning model that can be used to improve students' communication skills.

Keywords: Communication Skills; Reliability, RODE; Student; Validity

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1. Introduction

21st-century skills become essential for dealing with the industrial revolution 4.0. Communication is one of the 21st-century talents that students must possess. The National Science Standard also suggests that communicating and scientific argument become one of the main things students need to learn (Etkina et al., 2006). The study's findings revealed how critical it is for students in Indonesia to learn and develop communication skills (Aberšek, 2010; Etkina et al., 2006; Greenhill & Petroff, 2010; Kulgemeyer & Schecker, 2013; Nielsen, 2013). As a result, educators in Indonesia are required to improve students' communication skills.

The *Read Outline Discussion Evaluation* (RODE) learning model is designed to help students improve their communication skills. Each syntax in the RODE learning paradigm explores communication skills, allowing students to improve their communication skills more rapidly and effectively. A hypothetical RODE learning model was constructed in a prior study based on innovations from problem-based and problem-solving learning models, which were claimed to increase students' communication skills.

The product must be valid, practicable, and effective (Plomp & Nieveen, 2013). It is also true that the RODE learning model was created to help students improve their communication skills by achieving the criteria of validity, practicability, and effectiveness. This study is the first step toward proving the validity of the constructed RODE learning model. The content validity, construct validity, and reliability components of the RODE learning model were examined. Following the declaration of the RODE learning model as valid and reliable, it can theoretically be used to examine the practicality and usefulness of the model in improving students' communication skills.

1.1. Conceptual or Theoretical Framework

1.1.1 Students' Communication Skills

The study by the American Association of Colleges of Teacher Education (AACTE) and The Partnership for 21st Century Skills (P21) stated that communication skills are essential to developing the learning process. In addition to work productivity in teams, self-evaluation, time management, and problem-solving, communication skills must be possessed in the era of information technology development and global economic growth in the 21st Century (Greenhill & Petroff, 2010). Therefore, communication skills should be taught explicitly (Kit, Liem & Chong, 2022; Dewiet al., 2023). Furthermore, learning should allow students to identify communication aspects scientifically, describe communication's role, and reflect on the relationship between knowledge production and communication (Nielsen, 2013).

This study formulated indicators of communication skills by referencing the opinions of some experts: Adler & Rodman (2006), Eunson (2012), Fraser-Abder (2011), Johnson & Johnson (2002), Spektor-Levy et al. (2008); Jederlund & von Rosen (2022). The following are indicators of written communication skills: (1) making tables/graphs/charts of experiment/observation results, (2) interpreting tables/graphs/charts of experiment/observation data, and (3) formulating conclusions. In comparison, the indicators of oral communication skills are (1) describing experimental/observation procedures, (2) listening, (3) responding to opinions, (4) asking questions, (5) answering questions, and (6) conveying conclusions. This study aims to design a RODE learning model to train students' communication skills more efficiently and optimally.

1.1.2 Problem-Based Learning

A learning breakthrough called problem-based learning gives students numerous critical techniques for thriving in the 21st century. The benefit of the problem-based learning model is that it teaches students how to become expert communicators in addition to new technology skills and advanced problem solvers (Smaldino et al., 2014). Problem-based learning also improves communication, social

skills, self-study, group work, inquiry, problem-solving, and group work (Bell, 2010; Qodry et al., 2016; Smaldino et al., 2014; Wangsa et al., 2017; Adriaensen et al., 2019; Crespí, García-Ramos & Queiruga-Dios, 2022). However, project-based learning implementation has several things to improve, such as more time to finish the material delivery and learning objectives. In addition, some teachers need to become more accustomed to problem-based learning (Zhou et al., 2013; Qodry et al., 2016; Shivni et al., 2021).

1.1.3 Problem-Solving

According to specific research findings, in addition to fostering students' problem-solving and creativity, cognitive skills, and motivation to learn, the problem-solving learning model can also help them communicate more effectively (Pehkonen & Helsinki, 1997; Djamarah & Zain, 2010; Vickery et al., 2023). According to Carolin et al. (2015), problem-solving-based learning is efficient and valuable and highly enhances communication and inference skills (Przymuszała et al., 2021). Along with having a significant impact on communication skills, this learning paradigm also has a significant impact on students' skills to infer (Kruger et al., 2023). According to Rudibyani (2018), the problem-solving learning paradigm is effective and significantly impacts increasing communication skills and conceptual mastery.

There are several drawbacks to problem-solving, including the time to learn and the difficulty in coming up with good problems to present. In addition, the lecturer needs to manage the students' experience and age level and the need for more time to allow for discussion opportunities after students solve the given problem (Smaldino et al., 2014).

1.1.4 Learning Model Development

Referring to these recommendations, the researcher conducted a literature review to design a RODE learning model with four syntaxes: the efficiency of the problem-based and problem-solving learning model syntax. The syntax of the RODE learning model was created based on theoretical and empirical investigations of the PBL model, problem-solving model, physics learning, and communication skills. Researchers undertake literature reviews of learning theories from many reference books to uncover theoretical and empirical evidence. The researcher also conducts empirical studies of various research findings of the application of learning models and communication skills, after which they analyze indicators of communication skills that have been abstracted from various references and linked to the syntax of the PBL model and problem-solving.

The RODE learning model was developed to train the communication skill indicators at each learning site. As part of the learning process, lecturers employ learning models to assist students in mastering specific learning objectives and developing ideas, skills, ways of thinking, and understandings through their preferred learning styles. The instructor sets up thoughtful, organized planning. There are four features of the learning model to achieve learning objectives: 1) logical theoretical justification from its design, 2) learning objectives from the developed model, 3) teaching behavior necessary in learning, and 4) the learning environment to achieve learning objectives (Arends, 2012; Joyce et al., 2015).

The Read syntax is the first syntax of the RODE learning model. It is extracted from the syntax directing students to the problem and organizing them to learn the PBL model and the syntax of formulating the problem and analyzing the problem-solving learning model. Outline syntax is the efficiency of the syntax assisting independent or group investigations on PBL as well as syntax formulating hypotheses and collecting data on the problem-solving learning model. Discussion syntax is an extraction of the syntax of developing and presenting artifacts and exhibits on the PBL model and testing the hypothesis on the Problem-Solving learning model. Finally, Evaluation syntax is an extraction of the syntax of analyzing and evaluating the problem-solving process on the PBL model and drawing conclusions on the Problem-Solving learning model. The four syntaxes of the hypothetical model of the RODE learning model are aimed at training communication skills in learning more efficiently and optimally.

The RODE learning model places the learner at the center of the educational process. The learning goals outlined in the learning objectives are achieved by providing students with settings and critical roles to acquire the necessary information and skills. It is recommended that students perform actively and collaboratively while integrating their various skills. A learning model must have both construct and content validity to be used in the learning process (Akker et al., 2007). The RODE learning model developed by researchers is stated to be valid if it meets the need, is the latest (state of the art), has a solid theoretical and empirical foundation, and there is consistency between the constituent components of the model. The characteristics of the RODE learning model refer to Joyce et al. (2015), which state that there are five main components in the model: (1) syntax, (2) social systems, (3) reaction principles, (4) support systems, and (5) instructional impact and accompaniment impact.

1.2. Related Research

The literature review results in this study state that the problem-based and problem-solving learning models claim to improve students' communication skills. The findings of these studies suggest that interventions are still required in the learning process that applies problem-based and problem-solving models, specifically related to time efficiency, motivation, and learning activities that explicitly train communication skills. In addition, there have been claims of success in enhancing students' communication skills while learning, as stated by Adriaensen et al. (2019), Bell (2010), Carolin et al. (2015), Overton & Randles (2015), Qodry et al. (2016), Rudibyani (2018), Smaldino et al. (2014), Tawil & Liliasari (2013), and Zhou et al. (2013). Thus, problem-based and problem-solving learning models have yet to train students' communication skills fully. Moreover, there has yet to be a single specific learning model designed to train students' communication skills. Therefore, the RODE learning model is designed to train students' communication skills more efficiently and optimally.

1.3. Purpose of the Study

Communication skills must be explicitly trained in learning, and no specific learning model exists for that purpose. Furthermore, the RODE learning model must meet the validity aspect to be applicable in learning. As a result, this research aims to determine the validity and reliability of the RODE learning model to improve students' communication skills.

2. Materials and Method

The method used in this study is a validation technique that is part of research and development to produce a learning model design (Plomp & Nieveen, 2013). The design of the RODE learning model is still a theoretical concept and has yet to be empirically tested. Therefore, for the RODE learning model design to be declared valid before application, it was validated through expert assessment activities.

The RODE learning model was approved based on the content and construct validity. The need for an intervention whose design is based on current (scientific) knowledge is referred to as content validity (Akker et al., 2007). The following are some of the criteria for determining content validity: 1) The requirement for the RODE learning model to be developed; 2) the uniqueness of knowledge; 3) the RODE learning model's thinking framework; and 4) the RODE learning model description (Akker et al., 2007; Arends., 2012). A logically planned intervention is known as construct validity (Akker et al., 2007). The construct validity is evaluated from the following perspectives: 1) RODE learning model development consistency; 2) the thinking framework of RODE learning model formation; and 3) RODE learning Mode Description (Akker et al., 2007; Arends., 2012; Joyce et al., 2015).

2.1. Participants

The RODE learning model was verified by three education experts: a doctorate in physics education, research and evaluation, and education administration. The RODE learning model validation sheet is filled out by experts who review and appraise the researcher's learning model.

2.2. Data Collection Tools

The validity of the RODE learning model is assessed using a validation sheet consisting of the content and construct validity. Validation of model content aims to record the validity of the RODE model in terms of the latest and robustness of the theoretical foundation that builds the RODE learning model. The content validity components include the need to develop the RODE learning model, state-of-the-art knowledge, the thinking framework for the formation of the RODE learning model, and the description of the RODE learning model (Akker et al., 2007; Plomp & Nieveen, 2013). In detail, the components of the content validity assessment are presented in Table 1.

Table 1

Content Validity Assessment Components

Aspect	Components
The need to develop the RODE learning model	1. The importance of developing the RODE Learning Model to meet the needs of the 21st-century competency framework as written in the Partnership for 21st-century skills 2. The RODE Learning Model can meet the needs of 21st-century skills-based research trends, which is communication skills, to be successful in the present and future lives. 3. The RODE Learning Model meets the needs of the times according to the KKNI Curriculum. 4. The benefits of the RODE Learning Model refer to meeting the need for communication skills to succeed in the present and future. 5. The purpose of the RODE Learning Model refers to meeting the needs of communication skills to succeed in the present and future.
The state-of-the-art knowledge	The RODE Learning Model is built to meet aspects of state-of-the-art knowledge by correcting weaknesses based on the recommendations of existing researchers: 1) Problem-Based Learning (PBL) model (Adriaensen et, al, 2019; Ageorges et, al, 2014; Overton & Randles, 2015; Qodry et al., 2016). 2) Problem-solving (Carolin et al., 2015; Pehkonen, 1997; Rudibyani, 2018; Smaldino & Deborah, 2008); Cooperative Problem-Solving (Kulsum & Nugroho, 2014), Creative Problem-Solving (Oktaviani & Nugroho, 2015)
The thinking framework of RODE learning model formation	1. Review standard reference literature that meets the state-of-the-art aspects of physics learning in higher education. 2. Review of standard reference literature that meets the state-of-the-art aspect of communication skills. 3. Review of standard reference literature that meets the state-of-the-art aspects of the project-based and problem-solving models in improving communication skills. 4. Theories support the development of the Read Outline Discussion Evaluation (RODE) model: connectivism theories, constructivism socio-cognitive theories, motivation theories of learning, cognitive

	theories of learning, and behavioral theories of learning. It is supported by empirical foundations and standard references related to the need for innovative models to improve communication skills.
The description of the RODE learning model	1. The characteristics of the Learning Model: a) the objectives of the RODE Learning Model; b) the Stages of the Model and its Argumentation; Syntax Planning; c) the Implementation of Social Systems; Application of the Reaction Principle; Support System; d) Instructional and Accompaniment Impact. 2. Learning Environment and Classroom Management based on reference standards that meet aspects of state of the art. 3. Implementation of evaluations related to communication skills based on reference standards that meet the state-of-the-art aspects

The validation of the model construct aims to measure model validity in terms of the consistency of the components. Components for construct validity include consistency in the development of RODE learning models, the framework for forming RODE learning models, and descriptions of RODE learning models (Akker et al., 2006). In detail, the components of the construct validity assessment are presented in Table 2.

Table 2

Construct Validity Assessment Components

Aspect	Component
Consistency of the RODE Learning Model Development	1. Development of the RODE Learning Model with the 21st-century competency framework as written in the Partnership for 21st-century Skills is logically designed. 2. The compatibility between the RODE Learning Model and the needs of the 21st-century skills-based research trend, which is communication skills, to be successful in the present and future lives is logically designed. 3. The conformity between the RODE Learning Model and the demands of the times according to KKNI directions is logically designed. 4. The conformity between the rational importance of model development, the purpose of model development, and the benefits of model development are logically designed.
The thinking framework for the formation of the RODE learning model	1. Study standard reference literature meets the logical aspects of physics learning in Higher Education. 2. Standard reference literature review meets the logical aspects of communication skills. 3. Standard reference literature review meets the logical aspects of project-based and problem-solving models in improving communication skills. 4. There is consistency between theoretical and empirical support supporting the development of the Read Outline Discussion Evaluation (RODE) model. The following theories support the model: Connectivism theories, Constructivism socio-cognitive theories, cognitive theories of learning, behavioral theories of learning, and motivation theories of learning. The model is supported by empirical foundations and standard references for innovative models to improve communication skills.

	5. The RODE Learning Model is built consistently and logically to correct weaknesses based on the recommendations of existing researchers: the PBL model: Adriaensen et al., (2019); Overton & Randles, (2015); Qodry et al., (2016). 2) Problem-Solving Models: Carolin et al. (2015), Pehkonen (1997), Rudibyani (2018), and Smaldino & Deborah (2008). 6. The RODE Learning Model is built on the theory of educational psychology figures listed in the definitive book: Arends (2012), Moreno (2010), and Slavin (2011) logically designed.
The description of the RODE learning model	1. The characteristics of a consistently and logically designed Learning Model include a) the objectives of the RODE Learning Model; b) the Stages of the Model and its Argumentation; Syntax Planning; c) the Implementation of Social Systems; Application of the Reaction Principle; Support System; d) and Instructional and Accompaniment Impact. 2. The Learning Environment and Classroom Management were developed and logically designed. 3. Implementation Evaluation: Communication Skills developed logically designed

2.3. Procedure

The research data was collected by submitting a hypothetical study draft of the RODE learning model and an assessment sheet for validating the RODE learning model to three education experts. Three experts reviewed the hypothetical draft model and assessed it on the validation assessment sheet according to the guidelines of the validation instrument. In addition to providing scores for each component, the experts also provided suggestions for improving the hypothetical draft. Suggestions and corrections from experts became the subject of discussion and accommodated by researchers in improving the hypothetical model of the RODE learning model until it is declared valid and ready to be tested in lectures.

2.4. Data Analysis

The RODE learning model validation sheets, consisting of content and construct validation sheets, were used to collect validity and reliability data. The descriptive qualitative method was used to assess the validity of the RODE model and learning tool. The RODE learning model was revised using the validation results as a guide. The RODE learning model's validity was determined using the validity criteria listed in Table 3.

Table 3

Criteria for Assessment of the Validity of Learning Models and Tools

Score Interval	Assessment criteria	Explanation
3.25< P≤ 4.00	High Validity	It can be used without revision
2.50< P≤ 3.25	Valid	It can be used with minor revisions
1.75< P≤ 2.50	Low Validity	It can be used with multiple revisions
1.00≤ P≤ 1.75	Invalid	It can be used yet and still need consultation

Source: Adapted from Kemdiknas, (2010)

The reliability of the RODE learning model validation results and supporting equipment is determined using the percentage of agreement formula as follows:

$$R = [1-(A-B) / (A+B)] \times 100$$

Explanation : R = Reliability Coefficient

A = Valuation of the validator who gives a high score

B = Valuation of the validator who gives a low score

The validation findings are reliable if the R-value is 75 percent (Borich, 1994; Hunaidah et al., 2019).

Cronbach's Alpha analysis was used to improve the computation of the reliability of the RODE model validation sheet instrument (Fraenkel et al., 2012). Table 4 lists Cronbach's Alpha reliability intervals and requirements.

Table 4

Cronbach's Alpha Reliability Criteria

Score Interval	Reliability Criteria
$0,80 < \alpha \leq 1,00$	Extremely High
$0,60 < \alpha \leq 0,80$	High
$0,40 < \alpha \leq 0,60$	Moderate
$\alpha \leq 0,40$	Low

Source: Adapted from Arikunto, 2016

3. Results

The RODE learning model was approved based on the content and construct validity. The need for an intervention whose design is based on current (scientific) knowledge is referred to as content validity (Akker *et al.*, 2007). The following are some criteria for determining content validity: 1) The requirement for the RODE learning model to be developed; 2) the uniqueness of knowledge; 3) the RODE learning model's thinking framework; and 4) the RODE learning model's Description (Akker *et al.*, 2007; Arends., 2012).

A summary of the scores of each component of the content validity assessment of the RODE learning model is presented in Table 5.

Table 5

The Content Validity Assessment Scores

Aspect	Scores				
	Expert 1	Expert 2	Expert 3	Mode	Criteria
The need to develop the RODE learning model	4	4	4	4	High Validity
The state-of-the-art knowledge	4	4	4	4	High Validity
The thinking framework for the formation of the RODE learning model	3	3	3	3	Valid
The description of the RODE learning model	4	3	4	4	High Validity

The validity of the content of the RODE learning model includes high-validity criteria with a score mode of 4.00. Furthermore, the results of validating the content of the reliable RODE learning model based on the Percentage of Agreement of 85.71% and strengthened by the Cronbach Alpha coefficient of 0.838 are classified as high-reliability criteria (Arikunto, 2016; Borich, 1994; Fraenkel et al., 2012). Therefore, the RODE learning model has met the criteria for content validity, which is meeting the needs and updates (state of the art) (Akker et al., 2007; Hunaidah et al., 2019).

A summary of the scores of each component of the construct validity assessment of the RODE learning model is presented in Table 6.

Table 6

The Construct Validity Assessment Scores

Aspect	Scores				
	Expert 1	Expert 2	Expert 3	Mode	Criteria
Consistency of the RODE Learning Model Development	4	3	4	4	High Validity
The thinking framework for the formation of the RODE learning model	4	3	4	4	High Validity
The description of the RODE learning model	4	3	4	4	High Validity

The construct validity of the RODE learning model includes high validity criteria with a score of 4.00. The results of construct validation of the RODE learning model are reliable based on the percentage of agreement of 85.71% and reinforced by a Cronbach Alpha coefficient of 0.831 with high-reliability criteria (Arikunto, 2016; Borich, 1994; Fraenkel et al., 2012). The RODE learning model has met the criteria for construct validity, which is meeting the consistency between the constituent components of the model (Akker et al., 2007; Hunaidah et al., 2019).

4. Discussion

A stage of development study on the validity of the RODE learning model was based on theory and issue analysis, both discovered through preliminary investigations and literature studies. The three validators were shown the RODE learning model design created for an academic publication to evaluate its validity level. Content and construct validity were both parts of the measured validity.

The results of the validity of the contents of the RODE Learning Model presented in Table 5 show that the RODE learning model has met the aspects of need and novelty (state of the art). This result is consistent with the originality and uniqueness requirements for doctorate research, which call for a transdisciplinary strategy that combines many disciplines to solve issues and provide new insights. Psychology, physics, and education studies are incorporated into the RODE learning paradigm. The demands and novelty of the RODE Learning Model may be shown from 1) the RODE Learning Model compared to other models to develop student's communication skills, especially the project-based and problem-solving models, 2) The contribution of the RODE learning model to develop 21st-century skills and those who support them, 3) The function of the RODE learning model in putting KKNI into practice.

Based on Table 6, the construct of the RODE learning model is valid. The construct validity of the RODE learning model is determined based on consistency between phases in the model syntax, consistency between model components, and consistency between the model and the underlying theory. The theoretical basis for designing the model shows that the RODE is a learning model. This study's results align with Arends (2012), who states that learning models are different from strategies or methods because they have a coherent theoretical foundation to describe what and how students learn and how lecturers and students behave. Appropriate learning theory foundations can also determine learning problems, objectives, analysis, and assessment.

The novelty of the RODE learning model compared to the project-based and problem-solving models in improving communication skills lie in training students' communication skills in each phase. The first phase is the Read Phase. Lecturers share students' worksheets; in this case, students actively read the given worksheet, pay attention to and understand the objectives, and find and read sources and learning materials related to lecture topics. This syntax trains written communication skills with indicators of exploring and reading sources and learning materials and oral communication skills with indicators of listening, asking, and answering questions.

The second phase is Outline. The principle of openness in the theory of connectivity states that students are encouraged to explore the opinions and ideas of peers and student participation in learning (Carreño, 2014; Corbett & Spinello, 2020; Downes, 2012). Arends (2012) states that students have equal roles and responsibilities in acquiring and constructing knowledge. In this syntax, students (1) actively participate in planning and sharing ideas; (2) search, arrange, and present data (diagrams, drawings, and Tables); (3) formulate and select alternatives to solving a given task; (3) select a form and create a group presentation to present on the discussion syntax. Kulsum & Nugroho (2014), Qodry et al. (2016), and Wangsa et al. (2017) stated that a learning environment that requires students to be active, ask questions, answer and argue has a better influence on communication skills. Lecturers provide tiered guidance (Scaffolding) in completing tasks and exchanging ideas as a form of communication skills practice. The Scaffolding is per the implications of Vygotsky's social constructivist theory that students learn through interaction with more capable adults and peers. The concept is in the nearest zone of development (proximal zone development) (Slavin, 2018). This syntax trains (1) written communication skills with six indicators: creating tables/graphs/charts of observation results, interpreting tables/graphs/charts of observation results, and formulating conclusions; (2) oral communication skills with indicators of listening, responding to opinions, asking, and answering questions.

Discussion Phase, the principle of openness of the theory of connectivity proposed by Carreño (2014), Corbett & Spinello (2020), and Downes (2012), is coherent with that proposed by Kulsum & Nugroho (2014), which states that the provision of space to interact to share ideas, ask questions, answers, and opinions. In addition, the recommendations of Wangsa et al. (2017) are also adapted in this syntax through discussions controlled by mutually agreed game rules shortly before class discussion activities begin. Students are generally divided into the presenter group and the audience group. The presenter presents the results of mutual understanding in a group discussion, giving responses, opinions, and questions from the audience group. This is per Vygotsky's theory, which states that individuals build knowledge and skills through interaction with others and the environment. Extensive collaborative activities allow students to find and understand complex concepts more easily when discussing problems with others (Moreno, 2010). In controlling discussion activities, lecturers can pay attention to behavioral learning theory in stating that the frequency of students performing similar behaviors in learning can increase if they get pleasant consequences afterward, while unpleasant consequences can reduce the frequency of learning behaviors carried out by students (Slavin, 2018; Woolfolk, 2017). This syntax trains (1) written communication skills with indicators of creating tables/graphs/charts of observation results, interpreting tables/graphs/charts of observation results; (2) oral communication skills with indicators of explaining observation procedures, listening, responding to opinions, asking, answering questions, and delivering conclusions.

The evaluation phase is used to assess learning programs that lecturers can carry out on an ongoing basis, and the results can be used directly to make improvements. Brookhart (2010) states that evaluation activities can be carried out by asking students to make claims about the value of something and explain their reasons. Therefore, evaluation activities require active participation in the evaluation process by lecturers and students and the need for cooperation (Stavropoulou & Stroubouki, 2014). In this syntax, the presenting group conveys the conclusions of the lecture topic to which the audience group responds. The audience group appreciated the presentations made by the presenting group and the assessment of each group's work. Per the behavioral learning theory, which claims that positive outcomes can reinforce learning behavior, lecturers provide praise and assign ranks based on student assessments. Contrarily, adverse outcomes impair learning behavior (Arends., 2012). A specific performance (contingent praise) and clearly defined conduct are called praise (Slavin, 2018). The speaker provides the topic for the following meeting just before the presentation concludes. These syntactic exercises provide signs for generating conclusions in written communication and hearing and communicating conclusions

orally. To develop students' current communication skills, the RODE model features a series of phases specifically created to have students work on activities that must be finished collectively.

The results of this validation show that the RODE is a learning model. This study's results align with Arends (2012), who states that learning models are different from strategies or methods because they have a coherent theoretical foundation to describe what and how students learn and how lecturers and students behave. Appropriate learning theory foundations can also determine learning problems, objectives, analysis, and assessment.

Thus, the RODE learning model has met the valid conditions, both the content and the construct validity. State-of-the-art and needs to show that the RODE learning model is valid in content. In contrast, the consistency between parts of the model and the consistency between the model and the underlying theory indicate that the RODE learning model is declared constructively valid.

5. Conclusion

State-of-the-art and needs to show that the RODE learning model is valid in content. In contrast, the consistency between parts of the model and the consistency between the model and the underlying theory indicate that the RODE learning model is declared constructively valid. A valid RODE learning model can be used as a guide for practitioners in planning to learn based on practicing communication skills. Therefore, the RODE Learning Model is included in the valid criteria, both in content and construct, so it can be used as a guide in preparing plans to improve student communication skills.

However, the results of this study still need to be improved in ideas that are systematically and logically based on the support of a literature review. Moreover, the findings of the RODE learning model design to determine the level of practicality and effectiveness in improving students' communication skills must be carried out in learning trials. So, the RODE Learning model can be used as a learning design.

References

Aberšek, B. (2010). Development Of Communication Training Paradigm for Engineers. *Journal of Baltic Science Education*, 9(2), 99–108. http://www.scientiasocialis.lt/jbse/files/pdf/vol9/99-108.Abersek_Vol.9_No.2.pdf

Adler, R. B., Rodman, G. R., & Sévigny, A. (2006). *Understanding human communication* (Vol. 10). Oxford: Oxford University Press. https://erickramerphd.net/download/papers/Kramer1991-masscomm.pdf

Adriaensen, J., Bijsmans, P., & Groen, A. (2019). Monitoring Generic Skills Development in a Bachelor European Studies. *Journal of Contemporary European Research*, 15(1), 110–127. https://www.jcer.net/index.php/jcer/article/view/1018

Akker, J. van den, Gravemeijer, K., McKenney, S., & Niveen, N. (2006). *Educational Design Research (1st ed.)*. Routledge. https://doi.org/10.1007/978-3-658-25233-5_3

Arends., R. I. (2012). Learning To Teach, Ninth Edition (9th ed.). McGraw-Hill.

Arikunto, S. (2016). Dasar-dasar evaluasi pendidikan (edisi revisi). Rineka Cipta.

Bell, S. (2010). Project-Based Learning for the 21st Century: Skills for the Future. The Clearing House: *A Journal of Educational Strategies, Issues, and Ideas*, 83(2), 39–43. https://doi.org/10.1080/00098650903505415

Borich, G. (1994). Observation Skill for Effective Teaching. Mac Millan Publishing Company.

Brookhart, S. M. (2010). How To Assess Higher-Order Thinking Skills in Your Classroom. 88 (18), *ASCD*. https://doi.org/10.1177/002205741808801819

Carolin, Y., Saputro, S., & Saputro, A. N. C. (2015). Penerapan Metode Pembelajaran Problem Solving Dilengkapi LKS untuk Meningkatkan Aktivitas dan Prestasi Belajar pada Materi Hukum Dasar Kimia

Siswa Kelas X Mia 1 SMA Bhinneka Karya 2 Boyolali Tahun Pelajaran 2014/2015. *Jurnal Pendidikan Kimia*, *4*(4), 46-53. https://jurnal.fkip.uns.ac.id/index.php/kimia/article/view/6569

Carreño, I. del V. G. (2014). Theory of Connectivity as an Emergent Solution to Innovative Learning Strategies. *American Journal of Educational Research*, 2(2), 107–116. https://doi.org/10.12691/education-2-2-7

Corbett, F., & Spinello, E. (2020). Connectivism and leadership: harnessing a learning theory for the digital age to redefine leadership in the twenty-first Century. *Heliyon*, 6(1), e03250. https://doi.org/10.1016/j.heliyon.2020.e03250

Crespí, P., García-Ramos, J. M., & Queiruga-Dios, M. (2022). Project-Based Learning (PBL) and Its Impact on the Development of Interpersonal Competences in Higher Education. *Journal of New Approaches in Educational Research*, *11*(2), 259-276. https://eric.ed.gov/?id=EJ1351403

Dewi, S. P., Wilson, A., Duvivier, R., Kelly, B., & Gilligan, C. (2023). Perceptions of medical students and their facilitators on clinical communication skills teaching, learning, and assessment. *Frontiers in Public Health, 11*. https://www.frontiersin.org/articles/10.3389/fpubh.2023.1168332/full

Djamarah, S. B., & Zain, A. (2010). Strategi Belajar Mengajar. Rineka Cipta.

Downes, S. (2012). Connectivism and Connective Knowledge: essays on Meaning and learning networks. In National Research Council Canada, http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Connectivism+and+Connective+Knowledge+Essays+on+meaning+and+learning+networks#0

Etkina, E., Van Heuvelen, A., White-Brahmia, S., Brookes, D. T., Gentile, M., Murthy, S., Rosengrant, D., & Warren, A. (2006). Scientific abilities and their assessment. *Physical Review Special Topics - Physics Education Research*, 2(2), 1–15. https://doi.org/10.1103/PhysRevSTPER.2.020103

Eunson, B. (2012). Communicating In the 21st Century (3rd ed.) (3rd ed.). John Wiley and Sons, ltd.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). How to Design and Evaluate Research in Education (8th ed.). McGraw-Hill.

Fraser-Abder, P. (2011). Teaching Emerging Scientists: Fostering Scientific Inquiry with Diverse Learners in Grades K-2. PEARSON.

Greenhill, V., & Petroff, S. (2010). The 21st Century Knowledge and Skills in Educator Preparation. In Education (Issue September). http://www.oecd-ilibrary.org/education/teachers-for-the-21st-century_9789264193864-en

Hunaidah, M., Susantini, E., & Wasis, W. (2019). Validitas Model Pembelajaran CinQASE untuk Meningkatkan Keterampilan Individual Critical Thinking (INCT) dan Col-laborative Critical Thinking (CCT). In *Prosiding Seminar Nasional Fisika PPs Universitas Negeri Makassar* (Vol. 1). http://103.76.50.195/semnasfisika/article/view/8680

Jederlund, U., & von Rosen, T. (2022). Teacher–student relationships and students' self-efficacy beliefs. Rationale, validation, and further potential of two instruments. *Education Inquiry*, 1-25. https://www.tandfonline.com/doi/abs/10.1080/20004508.2022.2073053

Johnson, R. T., & Johnson, D. W. (2002). Pengantar Ilmu Komunikasi. Pustaka Utama.

Joyce, B., Weil, M., & Calhoun, E. (2015). Models Of Teaching (9th ed.). Pearson Education, Inc.

Kemdiknas. (2010). Juknis Penyusunan Perangkat Penilaian Afektif di SMA. Direktorat Pembinaan SMA.

Kit, P. L., Liem, G. A. D., & Chong, W. H. (2022). Teacher-student relationship and student engagement: the moderating role of educational hope. *Educational Psychology*, *42*(9), 1180-1197. https://www.tandfonline.com/doi/abs/10.1080/01443410.2022.2108766

Kruger, J. S., Doloresco, F., Maerten-Rivera, J., Zafron, M. L., Borden, H., & Fusco, N. M. (2023). An Innovation Sprint to Promote Problem-solving and Interprofessional Skills Among Pharmacy and Public Health Students. *American Journal of Pharmaceutical Education*, *87*(1). https://www.ajpe.org/content/87/1/ajpe8852.abstract

Kulgemeyer, C., & Schecker, H. (2013). Students Explaining Science-Assessment of Science Communication Competence. *Research in Science Education*, 43(6), 2235–2256. https://doi.org/10.1007/s11165-013-9354-1

Kulsum, U., & Nugroho, S. (2014). Penerapan Model Pembelajaran Cooperative Problem. Unnes Physics Education Journal, 3(2). https://journal.unnes.ac.id/sju/index.php/upej/article/view/3600

Moreno, R. (2010). Educational Psychology. In John Wiley & Sons, Inc. 53(9).

Nielsen, K. H. (2013). Scientific Communication and the Nature of Science. *Science and Education*, 22(9), 2067–2086. https://doi.org/10.1007/s11191-012-9475-3

Oktaviani, A. N., & Nugroho, S. E. (2015). Penerapan model creative problem solving pada pembelajaran kalor untuk meningkatkan pemahaman konsep dan keterampilan komunikasi. *UPEJ Unnes Physics Education Journal*, *4*(1). https://journal.unnes.ac.id/sju/index.php/upej/article/view/4733

Overton, T. L., & Randles, C. A. (2015). Beyond problem-based learning: Using dynamic PBL in chemistry. *Chemistry Education Research and Practice*, 16(2), 251–259. https://doi.org/10.1039/c4rp00248b

Pehkonen, E., & Helsinki. (1997). The State of Art in Mathematical Creativity. *Zentralblatt Für Didaktik Der Mathematik*, 29(3), 63–67. https://doi.org/https://doi.org/10.1007/s11858-997-0001-z

Plomp, T, & Nieveen, N. (2013). Educational Design Research Educational Design Research. In T Plomp & N. Nieveen (Eds.), Netherlands Institute for Curriculum Development: SLO (1st ed.). SLO. http://www.eric.ed.gov/ERICWebPortal/recordDetail?accno=EJ815766

Przymuszała, P., Cerbin-Koczorowska, M., Marciniak-Stępak, P., Zielińska-Tomczak, Ł., Piszczek, M., Jasiński, J., & Marciniak, R. (2021). Affective and cognitive components of students' attitudes towards communication learning-validation of the Communication Skills Attitude Scale in a cohort of Polish medical students. *BMC medical education*, *21*(1), 1-14. https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-021-02626-7

Qodry, I., Nuroso, H., & Susilawati, S. (2016). Pengaruh Model Pembelajaran Problem Based Learning melalui Pendekatan Saintifik terhadap Kemampuan Berkomunikasi Ilmiah pada Kelas X di SMA Negeri 1 Rembang. *Jurnal Penelitian Pembelajaran Fisika*, 7(1), 34–42. https://doi.org/10.26877/jp2f.v7i1.1151

Rudibyani, R. B. (2018, December). The Effect of Problem-Solving Model to Improve Communicating Skills and Mastery Concept in Chemistry. In *3rd Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2018)* (pp. 810-815). Atlantis Press. https://www.atlantis-press.com/proceedings/aisteel-18/55909221

Shivni, R., Cline, C., Newport, M., Yuan, S., & Bergan-Roller, H. E. (2021). Establishing a baseline of science communication skills in an undergraduate environmental science course. *International Journal of STEM Education*, *8*(1), 1-15. https://stemeducationjournal.springeropen.com/articles/10.1186/s40594-021-00304-0

Slavin, R. E. (2018). Educational Psychology. In Psychological Bulletin (12th ed). 17(11). Pearson Education, Inc. https://doi.org/10.1037/h0071574

Smaldino, S. E., Deborah, L. L., & Russel, J. D. (2014). Instructional Technology and Media for Learning (10th ed). Pearson Education, Inc.

Spektor-Levy, O., Eylon, B. S., & Scherz, Z. (2008). Teaching communication skills in science: Tracing teacher change. *Teaching and Teacher Education*, 24(2), 462–477. https://doi.org/10.1016/j.tate.2006.10.009

Tawil, M., & Liliasari. (2013). Berpikir Kompleks dan IMplementasinya Dalam Pembelajaran IPA (1st ed.). *Badan Penerbit Universitas Negeri Makassar*.

Vickery, R., Murphy, K., McMillan, R., Alderfer, S., Donkoh, J., & Kelp, N. (2023). Analysis of Inclusivity of Published Science Communication Curricula for Scientists and STEM Students. *CBE—Life Sciences Education*, *22*(1), ar8. https://www.lifescied.org/doi/abs/10.1187/cbe.22-03-0040

Wangsa, P. G., Suyana, I., Amalia, L., & Setiawan, A. (2017). TSTS (Pada Materi Gerak Lurus di SMAN 6 Bandung). *Jurnal Wahana Pendidikan Fisika*, 2(2), 27–31. https://doi.org/https://doi.org/10.17509/wapfi.v2i2.8274

Woolfolk, A. (2017). Anita Woolfolk-Educational Psychology-Pearson International (2016) (Issue December).

Zhou, Q., Huang, Q., & Tian, H. (2013). Developing Students' Critical Thinking Skills by Task-Based Learning in Chemistry Experiment Teaching. *Creative Education*, 4(12), 40–45. https://doi.org/10.4236/ce.2013.412a1006