THE INFLUENCE OF WE-ARE (WARM-UP, EXPLORING, ARGUMENTATION, RESUME) MODEL INTEGRATED WITH 21ST-CENTURY SKILLS ON PROSPECTIVE BIOLOGY TEACHERS' COMMUNICATION SKILLS

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ABSTRACT

The research aims to identify the influence of the WE-ARe (Warm-up, Exploring, Argumentation, Resume) model integrated with 21st-century skills on prospective biology teachers' communication skills. The research type was quantitative, using a quasi-experiment research design. The research sample consisted of 60 biology education students in three classes. The research instruments used were valid and reliable observation sheets and questionnaires to measure communication skills. Data were analyzed using Covariate Analysis (ANCOVA) with a significant level of 5%. The research shows that the average communication in the experimental group after receiving treatment is 90.63, while in the positive control group, it is 73.54, and in the negative control group, it is 39.14. The test results to find out the difference in communication skills between the experimental and control groups obtained a calculated F value of 2846.491 with a significance value of 0.000. The significance value is smaller than the real level alpha 5% or (0.05). The research concludes that there is an influence of the WE-ARe model integrated with 21st-century skills on prospective biology teachers' communication skills. The learning phases of the WE-ARe model integrated with 21st-century skills are proven to improve verbal and non-verbal communication skills. WE-ARe is a new learning model developed by researchers to accommodate the learning needs of students in the Industry 4.0 era towards the Society 5.0 era by using the principles of constructivism, collaborative, and participatory elaboration. The research is expected to contribute to increasing the global competence of university graduates, especially teachers.

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Keywords: communication skills; learning models; WE-ARe integrated with 21-century skills

INTRODUCTION

Currently, students are faced with the era of globalization and information that is developing rapidly, an era where the participation and contribution of students are broadened beyond the scope of learning in the classroom and society. Communication, critical thinking, and problem-solving skills are essential to improve, especially in the 21st century (Carlgren, 2013; Tolino et al., 2020; Adiansyah et al., 2022). Communication requires interaction between humans to build a process of exchanging messages of information and knowledge with other people (Amin, 2023;

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Halimah & Sukmayadi, 2019). Effective communication can facilitate achieving the desired target results (Asfar et al., 2021; Alawamleh et al., 2022). Effective communication can assist students to satisfy learning objectives and do better academically during the classroom learning process.

Productive communication skills are needed to build effective communicative interactions displayed through oral interactions (Osuchukwu et al., 2019; Nurulita et al., 2022). A positive and meaningful relationship exists between student motivation, communication skills, and time management (Astra et al., 2019; Demirdağ, 2021). Students can engage in various activities in school with the support of effective communication (Ntoumanis et al., 2018; Hastuti et al., 2022). To develop proper and effective communication and eliminate potential communication conflicts, communication skills should be trained.

Communication is a fundamental need to enable us to interact with each other in various aspects of life (Urwani et al., 2018; Asman et al., 2022). Effective communication is essential to advancing learner understanding, collaboration, and innovation (Maddens et al., 2020; Akhter et al., 2021). Communication is one's ability to make contact with other people and make oneself understood regarding the intentions and goals conveyed (Sipayung et al., 2018; Punitha & Baskaran, 2021). It is vital to train communication skills so that students can communicate the results of their scientific work effectively and create optimal collaboration (Aini et al., 2020; Somphol et al., 2022). Communication can enable humans to express the concepts and ideas in their minds (Hidayati et al., 2020; Asrizal et al., 2022). The growing scientific and technological culture in a pluralistic society increases the need to develop communication patterns in building a scientific conceptual framework (Putra et al., 2020; Adiansyah et al., 2023).

Communication skills have received little attention to be empowered in the learning environment, including in problem-solving activities or other activities in the laboratory (Malik & Ubaidillah, 2021; Rati et al., 2023). To realize life skills that support the 4C of the 21st century to develop properly, students need to be given space to learn actively and independently with more flexible time and an interactive learning atmosphere (Güney, 2019; Astawa et al., 2022). Communication skills are vital in conveying ideas, facts, and concepts acquired by students (Oktaviani & Hidayat, 2017; Jalinus et al., 2023). Students must develop practical communication skills to convey messages according to their goals (Pal et al., 2016; Novitra et al., 2021).

Good communication skills are a prerequisite for student-teacher candidates. Students can be prepared to be sensitive to situations in the community environment by training in communication skills. It will enrich their understanding of communication ethics in the broader community at the individual, organizational, and systemic levels (Erdoğan, 2019; Bowen, 2020). An educator must be capable of communicating with his/her students and be a good role model in reflecting on the communication process in class (Halimah & Sukmayadi, 2019; Supena et al., 2021). The teaching and learning process itself is a communication process. Listening and speaking are important aspects of communication (Florence et al., 2022; Amin & Adiansyah, 2023). Effective communication is essential for personal and professional development in every area of life (Lestari et al., 2021; Shaniga & Ilankumaran, 2022). The characteristics of a reliable educator include having superior communication skills and the ability to successfully convey ideas and messages in various situations (Khalid & Yasin, 2013; Efendi et al., 2020).

Educators' communication skills are indispensable in the classroom (Amin et al., 2017a; Ahmad, 2018). Educators must comprehend what, how, and when to communicate, as well as the communication media available. Effective classroom communication promotes awareness, enlightenment, involvement, a sense of belonging, and performance effectiveness. It builds relationships between students and teachers in the classroom (Akudo, 2020; Suryandari et al., 2021).

Communication can be done verbally and non-verbally. Verbal communication uses words and sentences to transfer information either orally or in writing. Non-verbal communication applies sign language, such as expressions, symbols, and gestures (Amin & Adiansyah, 2018b; Sutiyatno, 2018). Good communication can produce high-performance effectiveness because problems can be solved together (Basir & Basir, 2020; Listiqowati et al., 2022).

Nonverbal communication is as necessary as verbal to convey meaning and messages. Carefully planned and skillfully delivered messages can motivate students to participate in class discussions, share ideas, be creative, and collaborate with others (Sakure, 2020; Amin & Adiansyah et al., 2023). Verbal communication helps students express learning needs by asking questions, describing events related to learning, expressing ideas or opinions related to learning, considering exis-

ting arguments, and helping express expressions of an observation (Abdikarimova et al., 2021; Hujjatusnaini et al., 2022). Adequate communication skills can train students' self-confidence, supporting future learning and career success (Miller & Grooms, 2018; Reith-Hall & Montgomery, 2019). Effective communication skills determine the success of teaching and learning (Kromydas, 2017; Syahril et al., 2022). Educators' awareness of building communication in learning is vital in increasing students' responsiveness to actual problem situations (Indrawati, 2021; Klefbeck, 2021).

Based on the results of the interviews, it is still found that students are shy to express their opinions, ask questions, and answer questions during class discussions. This shows that students' argumentation and communication skills are still lacking. The WE-ARe model is expected to be able to overcome these problems because, at the learning stage, it trains students to dare to ask, answer, and argue. Some students feel more comfortable writing down their ideas and opinions in written form but need more confidence to deliver directly to the class (Hariyanto et al., 2019). Students' lack of interaction also affects their interpersonal communication skills (Alshumaimeri & Alhumud, 2021). Communication between educators and students can prevent learning activities in the classroom from being monotonous. It can reduce motivation to achieve learning success (Unal & Gursel, 2015; Ardiansyah et al., 2021). The observation results on prospective biology teachers at IAIN Ternate, North Maluku, Indonesia, show that the level of verbal and non-verbal communication skills is still low, and it is necessary to optimize it in learning.

Using technology, such as videos, projectors, and software applications, and applying active learning models can improve oral communication skills (Widarti et al., 2020; Fatima et al., 2021). Experimental active learning can help students develop communication skills and more optimal interactive intensity (Haniah et al., 2021; Ngoc, 2021). Communication skills are an essential strategy for correct and effective interactive behavior in teaching and learning, which involves support from students, educators, and parents (Chatzinikola, 2021; Hujjatusnaini et al., 2022).

The WE-ARe model is an active learning model that can be used to accommodate the empowerment of students' communication skills, especially for prospective biology teachers. However, research studies that apply the WE-ARe model to communication skills in human anatomy and physiology lectures have never been carried out. Warm-up, exploring, argumentation,

and resume phases make up this model, which is mutually sustainable and supports the abilities that students need in the 21st century (Amin, 2022). Academic skills are necessary in the 21st century, especially in light of the complexity of society. Digital literacy, efficient communication, productivity, and creative thinking are a few of the skills required nowadays (Amelia & Santoso, 2021). The WE-ARe model is proven to increase prospective biology teachers' learning motivation, conceptual mastery, argumentation, metacognitive, and critical thinking skills (Amin, 2020). The WE-ARE model also significantly influences prospective biology teachers' digital literacy (Amin et al., 2023) and improves critical thinking skills (Amin et al., 2023). The WE-ARe learning model can provide confidence and positive energy to make learning progress by having an attitude of optimism toward learning success. The potential of WE-ARe will likely overcome communication issues faced by prospective biology teachers in learning. Research that examines the WE-ARe model in biological science learning in the aspect of communication skills is still rare. This can be a novelty in research.

This research examines whether the WE-ARe model integrated with 21st-century skills influences prospective biology teachers' communication skills. The research objective is to identify the influence of the WE-ARe model integrated with 21st-century skills on prospective biology teachers' communication skills. For teachers and lecturers, this research is expected to contribute to creating learning that stimulates students' communication skills both verbally and non-verbally. This is to achieve more optimal learning targets and competency outcomes for globally competitive graduates and ready to face challenges in the Industry 4.0 era towards the Society 5.0 era.

METHODS

This type of research was quantitative, using a quasi-experiment research design (pseudo-experiment) (Fraenkel & Wallen, 2008). The independent variable in this study was the WE-ARe model integrated with 21st-century skills, while the dependent variable was communication skills. The plan used was Pretest-Posttest Control Group Design. The study used three treatment groups. The experimental group was carried out by applying the WE-ARe model integrated with 21st Century Skills. Furthermore, the positive control class used the STAD-type cooperative model, and the negative control class applied conventional learning. Researchers chose the STAD model with the consideration that

this model is one of the active cooperative models that is easiest to implement by lecturers. Meanwhile, conventional learning is used as a comparison because this learning is most widely used in classroom learning. The three groups were each given a test before and after learning. The negative control class used conventional learning that lecturers usually use in teaching biology in class. This learning was a direct instruction model and lecturing method.

Table 1. The Pretest-Posttst Control Group Design

Group	Pretest	Treatment	Posttest
Experimental	O_1	WE-ARe integrated with 21st-century skills.	O_2
Control Positive	O_3	Student Team Achievement Division (STAD)	O_4
Control Negative	O_5	Conventional Learning	O_6

Based on the research design, the research procedure is presented in Figure 1.
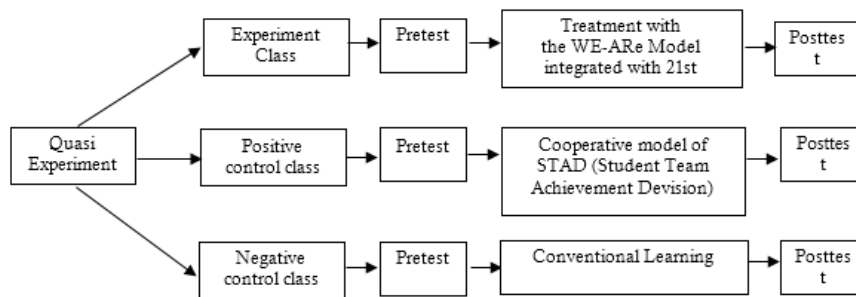
Figure 1. Research Procedure

The WE-ARe model syntax consisted of a warm-up, exploring, argumentation, and resume phases. The phases of learning activities carried out by lecturers and students are described in Table 2 (Amin, 2022). These activity phases are then integrated with 21st-century skills. Whereas, STAD-type cooperative learning syntax consisted of the phase of conveying goals and motivating students, the phase of presenting/delivering information, the phase of assigning students to study groups, the phase of guiding work and study groups, the evaluation phase, and the phase of giving rewards (Slavin, 2018).

Table 2. WE-ARe Learning Model Syntax

Syntax	Learning Activities	
	Lecturers	Students
Phase 1 Warm-up	Provide opportunities for students to read literature related to the material to be discussed	Read literature related to the material to be discussed
	Provide opportunities for students to write down questions related to the material	Formulate essential questions related to the material
Phase 2 Exploring	Provide opportunities for students to conduct scientific investigations based on the learning experiences obtained Scientific investigations can be in the form of experimental activities or problem-solving based on some instances related to the material.	Conduct scientific investigations based on the learning experiences that have been obtained Scientific investigations can be in the form of experimental activities or problem-solving based on some instances related to the material.
Phase 3 Argumentation	Facilitate students to develop argumentative discourse and renew understanding	Produce works in the form of argumentative discourse
Phase 4 Resume	Facilitate students to create resume-related material	Make resume-related material

The study population was all Biology Education students at IAIN Ternate and STKIP Kie Raha, Ternate City, North Maluku, Indonesia. The research sample was 60 fourth-semester biology education students in three classes. Biology class A IAIN Ternate acted as an experimental class and was taught using the WE-ARe model integrated with 21st-century skills with a sample size of 20 people. Biology class B IAIN Ternate acted as the positive control class and was taught using the STAD-type cooperative learning model with a sample of 20 people. Biology class A STIKIP Kie Raha Ternate acted as the control class and was taught using conventional learning with a sample size of 20 people. This sample was representative of all biology education study programs in the city of Ternate, North Maluku. Before determining the sample, an equivalence test was carried out on the class by giving a placement test. The questions went through a process of expert and empirical validation beforehand. The result showed that all items were declared valid and reliable. The research was conducted in the Even Semester of the 2021/2022 Academic Year. The results of the equivalence test are presented in Table 3.

Table 3. The Class Equality Test Results

Class	Mean	LSD Notation
Class B IAIN Ternate	63.0476	a
Class A IAIN Ternate	63.0909	a
Class A STKIP Kie Raha	63.8000	a
Class B STKIP Kie Raha	68.3810	b

The research instrument used was an instrument to measure communication skills. Before being used in data collection, all research instruments had to go through expert and empirical validation. Expert validation was carried out by three lecturers who are experts in learning device development, learning design, and learning materials. Data related to communication skills were collected through observation sheets and questionnaires. It occurred in the learning process during the discussion and presentation. The overall mean of the instrument was in the valid category. All instruments were tested empirically and reliably. The test results showed that all instrument items for measuring communication skills were valid and reliable. The rubric was adapted from NEA (NEA, 2012) and P21 (P21 (Partnership for 21st Century Skills), 2011), which includes four indicators: speaking, listening, writing, and non-verbal. The alternative hypothesis in this study was that WE-ARe, integrated with the 21st century, influenced communication skills.

Data analysis used descriptive and inferential approaches. A profile picture of communication skills was produced by descriptive analysis. Descriptive statistical values included the mean, highest mean, lowest mean, standard deviation, and percentage change between the pretest and posttest. The effect of learning models on communication skills was examined by inferential analysis. In this case, to see how far the potential of the WE-ARe model integrated with 21st-century skills was on the dependent variable. Data were analyzed using Covariate Analysis (ANCOVA) with a significant level of 5% with the help of SPSS. Before the data were analyzed with ANCOVA, the requirements test was carried out: the normality and homogeneity tests. The normality test used the One-Sample Kolmogrov-Smirnov test. Homogeneity test used Levene's Test of Equality of Error Variances.
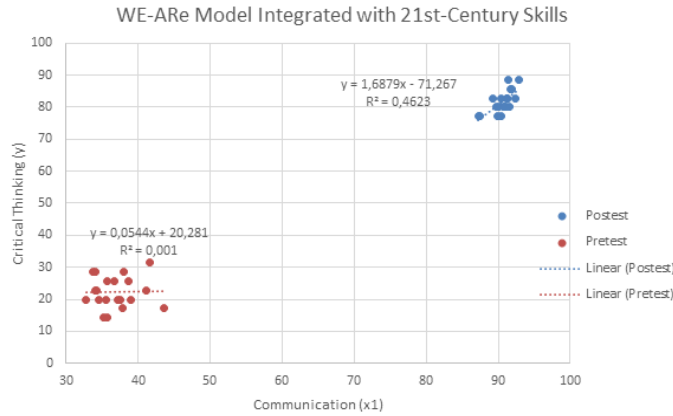
RESULTS AND DISCUSSION

The statistic test conducted to measure syntax implementation shows that the data parallel level has a significance value of 0.135. The data coincidence level has a significance value of 0.030. The data parallel level offers a number greater than 0.05, while the data coincidence level has a number smaller than 0.05. This figure shows that the syntax of the WE-ARe learning integrated with the 21st-century skills is parallel but not coincidental. The results of the consistency test (ANOVA) are in Table 4.

Table 4. The Statistic Test Results of the WE-ARe Learning Integrated with 21-Century Skills

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	35426.934	3	11808.978	737.547	.000
	b1,b2	37.372	1	37.372	2.334	.135
	b1,b2,b3	81.703	2	81.703	5.103	.030
	Residual	576.402	36	16.011		
	Total	144162.890	40			

Table 4 shows that the parallel data level (b1, b2) has a p-value of 0.135 and the data coincidence level (b1, b2, b3) has a p-value of 0.030. The first value is greater than 0.05 and the second value is smaller than 0.05. In this way, it can be seen that the two lines are parallel and do not coincide. These results illustrate that the WE-ARe learning syntax consisting of a warm-up, exploring, argumentation, and resume phases has been implemented consistently. The graph of the consistency test results for implementing the WE-ARe model syntax is shown in Figure 2.

Figure 2. Graph of Syntax Implementation Consistency of the WE-ARe Model Integrated with 21st-Century Skills

Figure 2 shows that the correlation between communication skills and critical thinking skills in implementing the WE-ARe model integrated with 21st Century Skills in the pretest shows a value of $Y = 0.0544x + 20.281$ with a value of $R^2 = 0.001$; while the posttest shows $Y = 1.6879x-71.267$ with an R^2 value = 0.4623. The consistency test conducted to measure syntax implement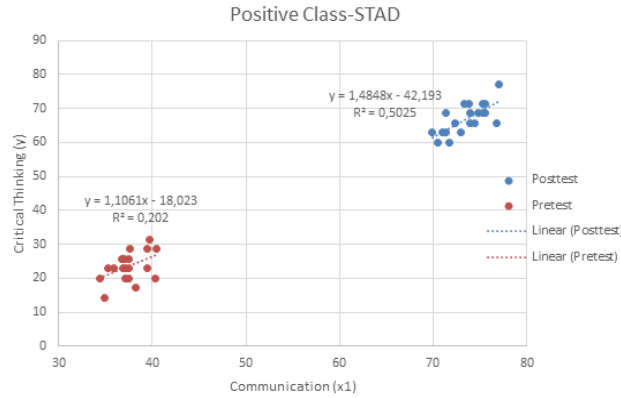ation shows that the data parallel level has a significance value of 0.476. The data coincidence level has a significance value of 0.540. The data parallel level offers a number greater than 0.05, while the data coincidence level has a number greater than 0.05. This figure shows that the learning syntax of the STAD Type Cooperative Model is parallel and coincidental. The results of the consistency test are in Table 5.

Table 5. The Statistic Test Results of STAD Type Cooperative Learning

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	19236.557	3	6412.186	512.079	.000
	b1,b2	6.485	1	6.485	.518	.476
	b1,b2,b3	4.784	2	4.784	.382	.540
	Residual	450.787	36	12.522		
	Total	101459.576	40			

Table 5 shows that the parallel data level (b1, b2) has a p-value of 0.476 and the data coincidence level (b1, b2, b3) has a p-value of 0.540. The first value and second value are greater than 0.05. Thus, it can be seen that the two lines are parallel and do not coincide. These results illustrate that the learning syntax of the STAD Type Cooperative Model comprises the phase of conveying goals and motivating students, the phase of presenting/delivering information, the phase of assigning students to study groups, a phase of guiding work and study groups, the evaluation phase, and the phase of giving awards has been implemented consistently. The graph of the consistency test results for implementing the STAD Type Cooperative Model syntax is shown in Figure 3.

Figure 3. Graph of STAD Type Cooperative Syntax Implementation Consistency

Figure 3 presents that the correlation between communication skills and critical thinking skills in implementing the STAD-type cooperative learning in the pretest shows a value of Y = 1,1061x-18,023 with a value of R^2 = 0,202; while the posttest shows Y = 1,4848x-42,193 with an R^2 value = 0,5025.

The consistency test conducted to measure syntax implementation shows that the data parallel level has a significance value of 0.318. The data coincidence level has a significance value of 0.132. The data parallel level offers a number greater than 0.05, while the data coincidence level has a number greater than 0.05. This figure shows that the learning syntax of the Conventional Model is parallel and coincidental. The results of the consistency test are in Table 6.

Table 6. The Statistic Test Results of Conventional Learning

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1383.053	3	461.018	34.459	.000
	b1,b2	13.707	1	13.707	1.025	.318
	b1,b2,b3	31.724	2	31.724	2.371	.132
	Residual	481.640	36	13.379		
	Total	33706.449	40			

The graph of the results of the consistency test of the implementation of conventional learning is shown in Figure 4. Learning taught using conventional learning is ordinary learning that is often used by lecturers in class, generally implementing direct instruction learning using the lecture method. This class consists of a sample of 20 people.
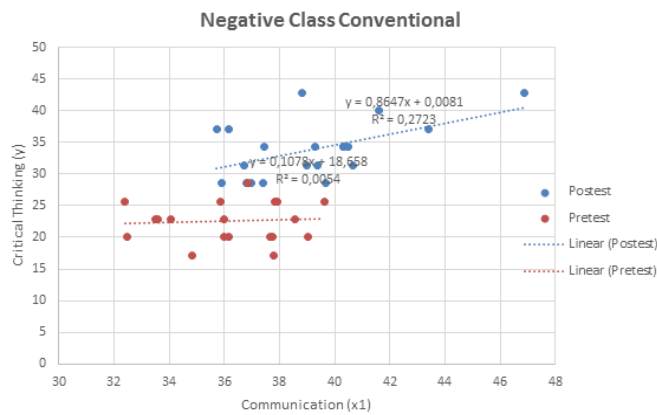
Figure 4. Graph of Conventional Learning Implementation Consistency

Figure 4 demonstrates that the correlation between communication skills and critical thinking skills at the implementation of conventional learning in the pretest shows a value of Y = 0,1078x+18,658 with a value of R^2 = 0,0054; while the posttest shows Y = 0,8647x+0,0081 with an R^2 value = 0,2723.

Descriptive data analysis includes the pretest and posttest results of communication in the experimental group and the positive control and negative control groups. Table 7 displays the experimental and control groups' minimum values, maximum values, average values, and standard deviation.

Table 7. Minimum Value and Maximum Value of the Pretest and Posttest on Communication Skills Based on the Experimental Group and the Positive and Negative Control Groups

Descriptive Statistic	Group					
	Experimental Class WE-ARe integrated with 21st-Century Skills		Positive Control Class - STAD		Negative Control Class - Conventional	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
N	20	20	20	20	20	20
Minimum	32.79	87.24	34.37	69.93	32.4	35.71
Maximum	43.55	92.81	40.4	77.03	39.63	46.88
Mean	36.844	90.636	37.475	73.54	36.291	39.147
Std. Deviation	2.85912	1.41716	1.70901	2.0978	2.17457	2.75638

Table 7 explains that the average obtained the pretest of 36.844 in the experimental group with a standard deviation of 2.85912. The positive control group obtained the average pretest of 37.475 with a standard deviation of 1.70901.

The negative control group obtained the average pretest of 36.291 with a standard deviation of 2.17457. The following is a graph of the average pretest and posttest values of communication skills.
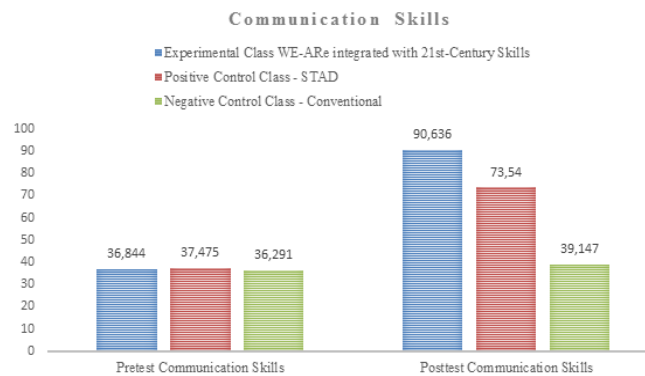
Figure 5. The Average Values of the Pretest and Posttest on Communication Skills

The results of the data normality test are based on the experimental group and the control group using the Kolmogrov-Smirnov test, presented in Table 8.

Table 8. Normality test of the Pretest and Posttest

	Class	Kolmogorov-Smirnova	Sig.	Description
Pretest Communication Skills	Experimental Class of the WE-ARe integrated with 21st-century skills	0.153	.200*	Normal Distribution
	Positive Control Class of STAD	0.169	0.139	Normal Distribution
	Negative Control Class of Conventional	0.189	0.061	Normal Distribution
Posttest Communication Skills	Experimental Class of the WE-ARe integrated with 21st-century skills	0.137	.200*	Normal Distribution
	Positive Control Class of STAD	0.107	.200*	Normal Distribution
	Negative Control Class of Conventional	0.143	.200*	Normal Distribution

Based on Table 8, the significance value (p-value) of the pretest and posttest in all groups is greater than 0.05 (p> 0.05), so the research data in all groups are normally distributed. The results of the data homogeneity test are based on the experimental group and the control group using Levene's Test, which is displayed in Table 9.

Table 9. Variety Homogeneity Test

Variable	Levene Statistics	Sig.	Description
Pretest Communication Skills	2,809	0,069	Homogeneous Variety
Posttest Communication Skills	3,119	0,052	Homogeneous Variety

Based on Table 9, the homogeneity test results obtained a significance value (p-value) in Levene's test of the pretest and posttest as a significant probability value of the data in the three groups greater than 0.05 (p> 0.05). Therefore, the pretest and posttest data of the experimental group and the positive and negative control groups have a homogeneous range of values.

Furthermore, the data analysis technique used to test the hypothesis in this study is Covariance Analysis (ANCOVA). The Covariance Analysis test aims to determine whether the WE-ARe model integrated with 21st-century skills influences communication skills with the pretest value as the covariance. The results of data analysis using ANCOVA are presented in Table 10.

Table 10. Results of Data Analysis Using ANCOVA

Tests of Between-Subjects Effects					
Dependent Variable: Posttest - Communication Skill					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	27509.061[a]	3	9169.687	1933.914	.000
Intercept	963.465	1	963.465	203.198	.000
Pretest Communication Skill	.603	1	.603	.127	.723
Group	26993.377	2	13496.689	2846.491	.000
Error	265.525	56	4.742		
Total	303376.202	60			
Corrected Total	27774.586	59			

a. R Squared = .990 (Adjusted R Squared = .990)

Based on Table 10, the test results to determine the difference in communication skills between the experimental and control groups obtained a calculated F value of 2846.491 with a significance value of 0.000. The significance value is smaller than the real level alpha 5% or (0.05). Therefore, there are differences in communication between the experimental group and the control groups. In other words, the WE-ARe model integrated with 21st-century skills significantly influences communication skills. The average communication in the experimental group after receiving treatment is 90.636. In the positive control group, it is 73.54; in the negative control group, it is 39.147. Based on these results, the WE-ARe model integrated with 21st-century skills can produce communication skills higher than the STAD and conventional cooperative models. Thus, there is an influence of the WE-ARe model integrated with 21st-century skills

on prospective biology teachers' communication skills. Effective communication skills can help avoid misunderstandings and miscommunication (Putri et al., 2021). Developing students' communication skills requires a lot of pedagogical practice, reflection, and continuous professional development (Cretu, 2017; Goel & Chauhan, 2019). Improving the quality of human resources and education can be realized through strengthening 21st-century skills, where students can have the motivation and moral responsibility to work and be globally competitive (Rian et al., 2020; Sima et al., 2020).

Based on the results of the examination and analysis of research data, it can be concluded that there is an influence of the WE-ARe model integrated with 21st-century skills on prospective biology teachers' communication skills. The stages in the WE-ARe model stimulate improvement in communication skills. At the beginning

of learning, students experience difficulties developing verbal and non-verbal communication aspects because students are still dominated by conventional learning. They have not been trained on how to communicate the results of scientific investigations effectively and efficiently. The level of student confidence to actively participate in argumentative discussions is still dominated by students with high academic abilities. Most students sit, listen, and receive the information provided. Students' scientific success depends on mastering various soft skills, especially scientific writing and speaking (Rusilowati et al., 2020; Montgomery et al., 2022). In the 21st century, communication skills are essential. Speaking and listening skills, which are components of language literacy, cannot be separated from communication skills (Ichsan et al., 2020). Students can learn to appreciate various points of view and perspectives in science communication by strengthening science communication skills in learning (Vickery et al., 2023). With the help of videos, self-reflection can provide transformative experiences for students to improve their oral science communication skills (Oliveira et al., 2021). Communication skills are important for effectively achieving learning and educational goals (Brinia et al., 2022; Lillo, 2023). The learning that is needed at this time is learning that not only repeats ideas but can also explores new ideas from students (Mustofa & Hidayah, 2020; Lagoudakis et al., 2023).

Applying WE-ARe learning integrated with 21st-century skills can train students to respond, conclude, evaluate, and provide comments and ideas as a form of feedback in communication. It is especially stimulated in the phase of exploration and argumentation. Students are trained to be able to present data presentations through tables, graphs, diagrams, charts, or other forms of presentation under the scientific investigation process that has been carried out. Student teachers are also trained to be involved in conveying information and using audiovisual devices to support the information presented. Learners are also taught how to listen and pay close attention to information obtained from colleagues, observe the results of presentations from other groups, and transform knowledge and learning experiences obtained in each phase of the WE-ARe learning model integrated with 21st-century skills. When students empower communication skills in the learning process, their critical thinking skills will also be involved (Ristanto et al., 2020; Hidayat et al., 2023) Good communication enables the transmission of ideas efficiently and effectively (Bautista et al., 2022). To construct thinking

discourse, students must be able to use communication principles to process the knowledge they have learned and arrange it in a social context (Mwakapina, 2020; Johar et al., 2023).

Communication is crucial in the learning process since it has a significant impact on learning through the intrapersonal process such as thinking, remembering, and perceiving, and the interpersonal process such as sharing ideas, respecting opinions, and listening to arguments (Rizki et al., 2019; Shivni et al., 2021). Communication skills can foster a conducive learning atmosphere in which students have confidence in presenting their arguments and stimulate empathy development to appreciate different points of view. Effective oral communication skills will enhance students's academic performance, job choices, professional competence, and personal effectiveness (Crebert et al., 2011). Communication skills are an essential requirement in everyday life. Individuals who are skilled at communicating are flexible and competitive wherever they are (Hikmah et al., 2022; Lustyantie et al., 2022). Someone has the intelligence to express opinions because they can overcome their problems and communicate well and effectively with others (Bambaeeroo & Shokrpour, 2017; Yasdin et al., 2021). If two people can carry out their roles properly, effective communication can be achieved (Pantiwati et al., 2023).

The warm-up phase in the WE-ARe model stimulates attention and confidence in students to express and submit questions voluntarily in learning. Students are also trained to answer questions correctly and have the courage to communicate their ideas or thoughts in front of the class. This is because, in the warm-up phase, students are given space and time to better prepare themselves through the reading process, so they are more confident to appear because they are supported by adequate mastery of literacy concepts. Asking and answering activities with friends can develop thinking skills and the courage to communicate formally. Verbal communication is a key skill for students to help them communicate their results and ideas orally through oral presentations, discussions, and debates and can predict the results of written exams (Haworth & Garrill, 2003; Haworth & Garrill, 2003; Amin et al., 2020). Communication and collaboration are needed so students can practice defining problems, negotiating goals, and developing socially structured procedures and knowledge (Cheruvelil et al., 2020). Communication is dynamic and interactive. Students can quickly answer, conclude, evaluate, and offer suggestions and comments as

a form of feedback in communication (Permana et al., 2020; Uyen et al., 2021).

Meanwhile, the resume phase trains prospective teacher students to listen, identify, revise, and compile the information obtained according to the learning experience they have passed. This phase can train student thinking and communication discourse to be more dynamic, interactive, and reflective in learning. Learners can practice compiling a concept of understanding or meaning of a lesson using their language. In this case, the lecturer can monitor the extent of the resume phase. This has a direct impact on the presentation of written information. Lecturers can identify the extent to which standard Indonesian spelling is used, punctuation marks, sentence structure arrangement, and paraphrasing ability. Through communication, students can exchange ideas and refine the concepts obtained (Amin & Adiansyah, 2018a; Slavin, 2018). The findings in the study are that the learning phases of the WE-ARe model integrated with 21st-century skills stimulate the improvement of communication skills in students. This model is a new learning model developed by researchers to accommodate the learning needs of students in the Industry 4.0 era towards the Society 5.0 era by using the principles of constructivism, collaboration, and participatory elaboration. Effective communication is important in teaching, affecting productivity and a more comfortable learning environment (Hasanah & Nasir Malik, 2020; Alawamleh et al., 2022). Multi-directional interactions in the implementation of learning models must be created by educators (Hariyadi et al., 2023). If educators do not help students build their skills through learning activities, students will not improve by themselves (Zavala-Crichton et al., 2022; Izzah et al., 2023). Students' learning outcomes will be less optimal due to inappropriate learning models applied by teachers (Rahardjanto et al., 2019; Adnan et al., 2021).

Indicators of oral communication that can be trained include expressing opinions clearly, respecting the other person, and asking relevant questions (Hutagalung, 2007). Written communication indicators can be trained by explaining in their language, explaining results in pictures or tables, and responding to problems with relevant reasons (Hodiyanto, 2017). Communication skills enable students to find accurate sources of information, filter information as new knowledge, and use information as additional knowledge to further their development (Kaburise, 2016). Students must participate in various oral academic activities to speak accurately, communicate ideas fluently, clearly pronounce, and confidently communicate ideas (Alghail & Mahfoodh, 2019; Nawawi & Azhari, 2020). Learning motivation will be seen when students appear serious and enthusiastic about participating in learning well (Van Alten et al., 2019; Tsai et al., 2020; Zheng & Zhang, 2020). The presentation aims to enable educators to control students' concepts and improve and strengthen them. So they will gain constructivist knowledge (Supena et al., 2021). Educators are expected to monitor and provide motivation so students can be trained to solve learning problems (Hidayat et al., 2018; Wang et al., 2020). There is a strong correlation between motivation and student achievement (Ziden et al., 2022).

Educators need clear communication skills to convey and disseminate the content being taught, build good relationships between educators and students, and construct an understanding of the subject during the learning process (Amin et al., 2017b; Florence et al., 2022). Educators must engage in continuous professional development and enhance their communication skills to accomplish effective communication concerning students' learning needs (Khan et al., 2017; Chatzinikola, 2021). Establishing effective communication with students in class is an important approach to effective classroom management (Asiyai, 2011; Bala, 2013). An educator must be able to accommodate the communication skills of his/her students to increase learning motivation and learning success optimally (Bee, 2012; Amin et al., 2016). Verbal and non-verbal communication skills are essential for graduate competency and professional success (Kompella et al., 2020; Wrighting et al., 2021). Initiatives to promote 21st-century education focus on skills that converge into three broad groups: cognitive, interpersonal, and intrapersonal, all of which encompass a complex set of interrelated sub-dimensions (Bao & Koening, 2019).

CONCLUSION

Based on the research and data analysis results, there is an influence of the WE-ARe model integrated with 21st-century skills on prospective biology teachers' communication skills. The average communication in the experimental group after receiving treatment is 90.636; in the positive control group, it is 73.54; and in the negative control group, it is 39.147. This research is expected to contribute to educators in empowering communication skills in classroom learning. The WE-ARe model integrated with 21st-century

skills can be an alternative learning model that accommodates the needs of life skills and global competence for the professionalism of college graduates. This research is still limited to being tested on prospective biology teacher students so that future researchers can conduct further research at different levels of education with a broader scope.

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