Evaluating Future-Oriented Thinking Skills in Educational Communication of Students at Prince Sattam bin Abdulaziz University

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Abstract

Future-oriented thinking is significantly required to be a part of the university curriculum, especially for educational students in teacher-training colleges. This study investigated the proficiency of future-oriented thinking skills in educational communication among education students at Prince Sattam bin Abdulaziz University's, focusing on future planning, forecasting, problem-solving, and imaginative thinking. The purpose of this study was to evaluate the extent to which these education students possess the essential skills to anticipate and address future challenges in educational communication. Using a descriptive-analytical approach, data were collected from 183 students using a structured questionnaire. The results revealed that students exhibited high proficiency in future planning (mean=2.585, SD = 0.437) and forecasting (mean=2.541, SD = 0.652), whereas their problem-solving (mean=2.497, SD = 0.496) and imaginative thinking skills (mean=2.455, SD = 0.573) were moderately developed. These findings indicate that, although current educational strategies effectively enhance planning and forecasting abilities, there is a critical need for interventions to improve creative problem-solving and imaginative skills among students at education college. The study concludes that a balanced educational approach is essential, emphasizing both future planning and forecasting, as well as problem-solving and imaginative thinking. The main recommendation is to implement innovative educational strategies and interventions that foster a comprehensive set of future-oriented thinking skills, thus preparing students to effectively navigate and address future challenges.

Keywords

Future-oriented Thinking, Educational Communication, Future Planning, Forecasting Skills, Problem-solving, Imaginative Thinking.

1. Introduction

Cognitive and technological transformations requires scientific and methodological engagement of students through future thinking, which involves precise understanding, prediction of potential problems, and proactive planning to mitigate negative consequences (**Aurava; Sormunen**, 2023). Higher education institutions globally have begun to focus on cultivating effective educational communication among students to enable them to confront the transformations and to contribute to societal development. Due to rapid scientific and technological advancements, it has become necessary that educational systems should evolve to prepare students for changes around them (**Pawlak; Moustafa**, 2023). Educational communication has relationship with thinking skills and develop essential competencies (**Yusuf; Adeoye**, 2012).

The significance of developing future-oriented thinking is particularly pertinent at the university level, especially for educational students in teacher-training colleges. Teacher preparation is the foundation of any educational reform aimed

at a better future (**Muchnik-Rozanov; Tsybulsky**, 2021). Therefore, it is essential for educational students to possess future-oriented thinking skills based on scientific principles, predictions, and expectations. This competence enables them to make informed decisions, solve problems, and manage crises. Several studies have underscored the importance of future thinking and have recommended its integration into curricula at various educational stages (**Sachyani *et al.***, 2023); however, not much attention has been given to develop educational communication among students.

Saudi Arabia's Vision 2030 aligns with this global approach, emphasizing education at all levels to prepare for future challenges (**Allmnakrah; Evers**, 2020). This vision underscores the importance of enhancing educational communication and thinking skills among students. Saudi Arabia's Vision 2030 also underscores the need to enhance the educational system to produce graduates equipped with critical thinking skills capable of addressing both present and future challenges (**Alharbi; Alshammari**, 2020). A need has also been felt to educate students about the importance of future-oriented thinking skills, and to draw researchers' attention to the importance of directing research ideas toward educational practices and learning activities that develop these skills, provides a measure of future-oriented thinking skills for use in various universities, and offers realistic results to inform developmental decisions at higher education institutions.

Therefore, this research was conducted to answer the following question: To what extent do educational students at Prince Sattam bin Abdulaziz University possess future-oriented thinking skills? There were three sub-questions to reflect the aforementioned question. 1. What specific future-oriented thinking skills are essential for education students at Prince Sattam bin Abdulaziz University? 2. How do students at Prince Sattam bin Abdulaziz University assess their abilities in future planning, problem solving, imagination, and prediction? 3. What are the variations in the extent to which education students at Prince Sattam bin Abdulaziz University possess future-oriented thinking skills, considering gender (male or female) and academic qualifications (bachelor's or master's)?

This study addresses the scarcity of research on this topic in Saudi Arabia, thereby filling an important gap in the literature. By its scope, this study aimed to evaluate the future-oriented thinking skills of students at Prince Sattam Bin Abdulaziz University. It sought to identify necessary skills, assess abilities in future planning, problem solving, imagination, and prediction, and examine differences based on gender and academic qualifications.

2. Literature Review

2.1. Educational Communication

Education communication is one of the important practice of exchanging valuable knowledge and ideas as well as information in educational environments to improve learning (**Goodboy; Myers**, 2008; **Merdian; Warrior**, 2015). It result in the use of several channels, such as verbal, nonverbal, digital, and media tools, to support valuable teaching and engagement between educators and students. Educational communication is a broad phrase that covers all speaking, listening, and relational aspects as well as concepts related to learning. This communication might take place in conventional contexts like classrooms or in casual learning spaces (**Maněnová *et al.***, 2024). It plays an important role in ensuring that learning objectives are understood and met. Effective educational communication supports clarity, motivation, and collaboration during the learning procedure.

2.2. Concept of Future-Oriented Thinking

The concept of future-oriented thinking pertains to a learner's perception of problems and capacity to formulate new hypotheses by connecting previous experiences and knowledge. This involves seeking solutions and presenting results, which necessitates the learner to ask questions, research, investigate, and use imagination (**Slaughter**, 1999). **Laherto and Rasa** (2022) defined future-oriented thinking as a cognitive practice based on observation and awareness to provide coherence and interaction of present possibilities for growth within a broader constructive context. This entails synthesizing and re-synthesizing a wide base of information to derive the desirable from what is possible, blending imagination and a focus on studying the past and present while considering the future.

Ballance *et al.* (2022) describe it as the mental process a student engages in to predict a topic, issue, or problem in the future, solve it, and prevent its occurrence or mitigate its impact based on the information currently available to them. Based on these definitions, future-oriented thinking is defined in this study as "the mental processes a learner engages in to address future problems to find solutions or avoid them, utilizing research practices that require awareness and understanding of their prior knowledge, and connecting it with current knowledge to aid in imagination, visualization, and prediction of the future."

2.3. Previous Research Analysis

Future planning is essential for students to improve their learning and understanding skills (**Rasa *et al.***, 2022). Particularly, educational communication has key importance for the students in learning activities. It is the responsibility of parents and teachers to motivate students for future oriented thinking (**Chia**, 2022). When students are motivated to think about the future, their working experience is improved. When the teachers are highly motivated to teach students,

they can develop a better approach to teach students. It is recommended that students should have significant approach for future thinking which can influence their routine working (**Levrini *et al.***, 2021). The support from parents regarding future thinking is also significant for education students. The students get motivation from the parents regarding their role in thinking and performance (**Maeda *et al.***, 2021). When students set a few goals to achieve, their approach to think about these goals expands positively. Meanwhile, it is also important that the students should be motivated for their significant behavior to work in directions to achieve success in future (**Aurava; Sormunen**, 2023). Besides, planning for the future helps students to grow and develop effective strategies for their work. It is a useful way to improve the overall behavior of students as their performance is influenced by it (**Hashimoto *et al.***, 2022).

Forecasting about future also helps students improve their behavioral and learning patterns (**Laherto; Rasa**, 2022). When students are motivated to learn new skills, they also understand the changing trends related to future (**Lee; Blankenship**, 2021). This proves a significant factor for students to improve their learning performance and behavior for future work. They are exposed to significant directions that can influence their learning and performance. Furthermore, forecasting also significantly helps teachers improve their working in students' benefit (**Ganzin *et al.***, 2020). When students are motivated by teachers to improve the educational status and skills, they understand the future trends and try to work accordingly (**Pawlak; Moustafa**, 2023). The information collection related to future changes helps the students to improve their current status by advancing their skills, which is a significant approach helpful in their future planning (**Yayuk; As' ari**, 2020). Additionally, any reliable way of forecasting helps students to improve their behavior which is necessary for strategic working.

Studies have also recommended that students should be exposed to a problem solving ways during their learning (**De Jaegere *et al.***, 2023). The problem-solving approach in students helps them to deal with different challenges. It is possible with creativity in the education as the motivated students deal with significant challenges in reliable way (**Ioannidou; Erduran**, 2022). Furthermore, an innovative approach in problem solving is necessary for students. A higher level of creativity in education helps students to improve their problem solving skills which is helpful for them to improve their learning and behavior (**Ballance *et al.***, 2022). Conversely, less motivated students are less creative to improve their learning behavior. It is therefore necessary for students to improve their behavior which has a lasting effect on their future (**Kwangmuang *et al.***, 2021). The reliable way of supporting the students advances their overall behavior and learning skills. A significant challenge in students' learning has emerged when they are less motivated for it. Therefore, it is recommended that the students should have significant capabilities to improve their learning with creative approach to deal with problems in future (**Tan; Wong**, 2020).

Studies have also found the role of imaginative thinking playing a significant role in the learning process of students (**Marnı *et al.***, 2020). The imagination about a good future helps the students to learn and perform well. When students are motivated about their future, they work hard to achieve their goals (**Sachyani *et al.***, 2023). For this purpose, the intrinsic and extrinsic motivation of students also play a key role. However, the learning performance of students is improved when they face significant challenges to deal with study (**Sutiani *et al.***, 2021). It helps to develop creative ability in them which enables them to think about the future. Therefore, the future oriented thinking is a valuable factor for students to improve their performance in a critical way (**Muchnik-Rozanov; Tsybulsky**, 2021). Furthermore, strategic advancement in thinking critically and imaginative thinking about future is a way forward for students to improve their learning performance. When the students are highly motivated to achieve their goals, it becomes a significant factor to deal with critical challenges (**Mueller; Washington**, 2022). Furthermore, the students who are good in education think about their future in an imaginative way and work hard to achieve their goals.

3. Methodology

3.1. Research Design

The study utilized a quantitative research design, involving collection, classification, and organization of data to draw meaningful conclusions and to generalize the phenomenon under study. This research was conducted during the second semester of the academic year 1445/2024.

3.2. Sampling and Population

The study population consisted of 109 male and 843 female students at education college enrolled at Prince Sattam Abdulaziz University. A sample of 183 students, comprising 109 male and 74 female students, was selected through a random sampling method. Table 1 presents the distribution of the sample according to gender The data indicated that 59.6% of the sample consisted of male students, whereas 40.4% were female. This distribution shows a higher representation of male students than of female students in the sample. Gender disparity might have influenced the study's outcomes, potentially highlighting the need for further investigation of gender-specific differences in future thinking skills. Ensuring more balanced gender representation in future studies could provide a more comprehensive understanding of this research topic.

Table 1: Distribution of Sample by Gender.

	Gender	Frequency	Percentage
1	Male	109	59.60%
2	Female	74	40.40%
Total		183	100%

Table 2 illustrates the distribution of the sample at an academic level. The data indicate that most of the sample (90.2%) are pursuing a bachelor's degree, while a smaller portion (9.8%) is pursuing a master's degree. This distribution highlights the fact that the study mainly focused on undergraduate students, with only a minor representation from graduate students. The predominance of bachelor's degree students could affect the generalizability of the findings to the master-level cohort, suggesting a potential area for future research to achieve a more balanced representation.

Table 2: Distribution of Sample by Academic Level.

	Academic Level	Frequency	Percentage
1	Bachelor's	165	90.20%
2	Master's	18	9.80%
Total		183	100%

3.3. Study Instrument

A questionnaire was designed and developed to evaluate the level of future thinking skills of education students at Prince Sattam University, following a review of the educational literature and previous studies relevant to the research topic. The final version of the questionnaire consisted of two main sections. The first section gathered primary data about the sample individuals, such as their gender and academic level. The second section included 32 items distributed across four dimensions, utilizing a three-point Likert scale (low, moderate, and high) to measure the level of future thinking skills of students at Prince Sattam University.

The validity of the study instrument was assessed using two methods. First, the internal consistency and validity of the instrument was evaluated. Second, the internal consistency and validity of each dimension was analyzed. Based on the responses of the sample individuals, the Pearson correlation coefficients between the scores for each item and the total score for the corresponding dimension were calculated. Table 3 shows that at the 0.01 level, all correlation coefficients between the statements and the total score of their respective dimensions from the questionnaire axes were statistically significant**.** Additionally, all the correlation coefficients were high. The coefficients for the first dimension, "Degree of Students' Possession of Future Planning Skills," ranged from 0.598 to 0.790. In the second dimension, "Degree of Students' Possession of Future Problem-Solving Skills", the coefficients ranged from 0.727 to 0.805. The coefficients for the third dimension, "Degree of Students' Possession of Future Forecasting Skills," ranged from 0.433 to 0.548. Finally, in the fourth dimension, "Degree of Students' Possession of Future Imagination Skills", the coefficients ranged from 0.772 to 0.896. This indicated a high level of internal consistency and validity of the statements within the questionnaire axes.

Table 3: Pearson Correlation Coefficients for Each Statement and Total Dimension Score.

First Dimension: "Degree of Students' Possession of Future Planning Skills"					
Paragraph Number	**Correlation Coefficient**	**Paragraph Number**	**Correlation Coefficient**	**Paragraph Number**	**Correlation Coefficient**
1	**0.722	4	**0.759	7	**0.790
2	**0.697	5	**0.785	8	**0.598
3	**0.773	6	**0.756		
Second Dimension: "Degree of Students' Possession of Future Problem-Solving Skills"					
1	**0.727	4	**0.795	7	**0.783
2	**0.793	5	**0.805	8	**0.800
3	**0.760	6	**0.786		
Third Dimension: "Degree of Students' Possession of Future Forecasting Skills"					
1	**0.458	4	**0.548	7	**0.433
2	**0.490	5	**0.543	8	**0.543
3	**0.525	6	**0.465		
Fourth Dimension: "Degree of Students' Possession of Future Imagination Skills"					
1	**0.772	4	**0.881	7	**0.788
2	**0.786	5	**0.896	8	**0.808
3	**0.823	6	**0.826		
**Statistically significant at the 0.01 level.					

The questionnaire axes were validated by calculating the correlation coefficients between the total score of each axis and the overall total score of the questionnaire. Table 4 demonstrates that the correlation coefficients for the questionnaire axes with the overall total score of the questionnaire were high, ranging from (.7500 to .9090). All coefficients were statistically significant at the 0.01 level. This indicated a high level of construct validity for the questionnaire axes.

Table 5 shows that the stability coefficients for the questionnaire axes were high, ranging from 0.874 to 0.939. The overall stability coefficient of the questionnaire was 0.969. These values demonstrate the validity of the questionnaire for application and reliability of its results, implying a confident reliance on them.

Table 4: Correlation Coefficients for Each Dimension and Overall Questionnaire Score.

No.	Dimension	Correlation Coefficient
1	First Dimension: "Degree of Students' Possession of Future Planning Skills"	.860**
2	Second Dimension: "Degree of Students' Possession of Future Problem-Solving Skills"	.909**
3	Third Dimension: "Degree of Students' Possession of Future Forecasting Skills"	.750**
4	Fourth Dimension: "Degree of Students' Possession of Future Imagination Skills"	.891**
**Statistically significant at the 0.01 level.		

Table 5: Cronbach's Alpha Coefficients for Questionnaire Axes.

No.	Dimension	Number of Items	Cronbach's Alpha Coefficient
1	First Dimension: "Degree of Students' Possession of Future Planning Skills"	8	0.874
2	Second Dimension: "Degree of Students' Possession of Future Problem-Solving Skills"	8	0.908
3	Third Dimension: "Degree of Students' Possession of Future Forecasting Skills"	8	0.939
4	Fourth Dimension: "Degree of Students' Possession of Future Imagination Skills"	8	0.921
	Stability Coefficient for the Entire Questionnaire	32	0.969

4. Results and Analysis

This descriptive study investigated the extent to which education students at Prince Sattam bin Abdulaziz University possess future thinking skills, using a questionnaire as the primary data collection tool. The study's findings, based on an analysis of questionnaire responses, indicate that students typically demonstrate a high degree of proficiency in future planning and forecasting, whereas their problem-solving and imaginative abilities are moderately advanced. These results are explained in detail in the following sections.

4.1. Overall Level of Future Thinking Skills

To determine the overall level of future thinking skills among education students, the mean and standard deviation were calculated for each dimension of the questionnaire. Table 6 exhibits the dimensions ranked in descending order based on their mean scores. This reveals that overall level of future thinking skills among students at Prince Sattam bin Abdulaziz University was high, with a mean score of 2.510 and standard deviation of 0.459. The dimensions of future thinking skills varied in their response levels, with future planning and forecasting skills ranking highest, followed by problem-solving and imagination skills.

Table 6. Essential Future Thinking Skills for Education Students.

No.	Dimension	Mean	No. of Items	Standard Deviation	Dimension Rank	Response Level
1	First Dimension: "Degree of Students' Possession of Future Planning Skills"	2.585	8	0.437	1	High
2	Third Dimension: "Degree of Students' Possession of Future Forecasting Skills"	2.541	8	0.652	2	High
3	Second Dimension: "Degree of Students' Possession of Future Problem-Solving Skills"	2.497	8	0.496	3	Moderate
4	Fourth Dimension: "Degree of Students' Possession of Future Imagination Skills"	2.455	8	0.573	4	Moderate
	Overall Questionnaire Score	2.51	32	0.457		High

4.2. Comparison of the Four Dimensions of Future Thinking Skills

The first dimension, "Degree of Students' Possession of Future Planning Skills," ranked highest among the four dimensions, with a mean score of 2.585 and standard deviation of 0.473, indicating a high response level from the study sample. The third dimension, "Degree of Students' Possession of Future Forecasting Skills," came in second, with a mean of 2.541 and a standard deviation of 0.652, also reflecting a high response level. The second dimension, "Degree of Students' Possession of Future Problem-Solving Skills," was ranked third, showing a moderate response level, with a mean of 2.497 and a standard deviation of 0.496. Finally, the fourth dimension, "Degree of Students' Possession of Future Imagination Skills," was fourth, indicating a moderate response level with a mean of 2.455 and a standard deviation of 0.573.

A notable finding from the analysis of academic level differences was the significant difference between bachelor's and master's students in their possession of future planning skills ($t(181) = 2.536$, $p = 0.012$). Bachelor's students demonstrated a higher mean score ($M = 2.611$, $SD = 0.422$) than master's students ($M = 2.340$, $SD = 0.507$). This suggests that undergraduate students may receive more guidance and resources that encourage them to focus on planning their immediate future and setting clear career objectives. The overall questionnaire score for future thinking skills among the sample students was moderate, with a mean of 2.510 and standard deviation of 0.457.

4.3. Presentation and Discussion of Study Hypotheses and Results

Table 7 illustrates the application of the independent samples test to investigate the differences in the sample's responses to the questionnaire axes and overall score according to gender. As shown in Table 7, there were no statistically significant differences between male and female students in their possession of future planning skills ($t(181) = -1.202$, $p = 0.231$, Cohen's $d = 0.18$) or future problem-solving skills ($t(181) = 0.128$, $p = 0.898$, Cohen's $d = 0.02$) at the 0.05 significance level. The small effect sizes suggest that the differences between Genders were minimal for these dimensions. Likewise, at the significance level of 0.05, the gender variable showed no statistically significant differences in the study sample's views on the third dimension, "Degree of Students' Possession of Future Forecasting Skills." The fourth dimension, "Degree of Students' Possession of Future Imagination Skills," also showed no statistically significant gender differences.

Table 7 also shows the overall questionnaire results indicating no statistically significant differences at a significant level of 0.05, according to the gender variable. This outcome may be due to the lack of noticeable differences in the facilities and support provided by governmental and private institutions in Saudi Arabia as well as the country's commitment to empowering women in line with Vision 2030. This perspective, shared by most study sample members, should encourage an increased interest in equipping female students with more future thinking skills to help them enter the workforce and demonstrate their capabilities after graduation.

Table 7: Independent Samples Test Results for Gender Differences at 0.05 Significance Level.

Dimension	Gender	N	Mean	Std. Deviation	Degrees of Freedom	t-Value	Significance	Significance Level
First Dimension: "Degree of Students' Possession of Future Planning Skills"	Male	109	2.553	0.47	181	-1.202	0.231	Not Significant
	Female	74	2.632	0.381				
Second Dimension: "Degree of Students' Possession of Future Problem-Solving Skills"	Male	109	2.501	0.495	181	0.128	0.898	Not Significant
	Female	74	2.492	0.501				
Third Dimension: "Degree of Students' Possession of Future Forecasting Skills"	Male	109	2.495	0.661	181	-1.148	0.252	Not Significant
	Female	74	2.608	0.637				
Fourth Dimension: "Degree of Students' Possession of Future Imagination Skills"	Male	109	2.464	0.551	181	0.272	0.786	Not Significant
	Female	74	2.441	0.607				
Overall Score	Male	109	2.504	0.469	181	-0.217	0.828	Not Significant
	Female	74	2.519	0.442				

Table 8 illustrates the application of the independent samples test to examine the differences in responses to the questionnaire axes and the overall score according to the academic level. As shown in Table 8, there was a significant difference in future planning skills between bachelor's and master's degree students ($t(181) = 2.536$, $p = 0.012$, Cohen's $d = 0.60$). Bachelor's students ($M = 2.611$, $SD = 0.422$) had a higher mean score than master's students ($M = 2.340$, $SD = 0.507$). This difference may be due to factors such as faculty guidance and university resources, which often influence undergraduate students' focus on planning their immediate future and setting clear career objectives. We found no significant differences between the two groups in the other dimensions or overall scores (all $p > 0.05$).

The lack of significant differences in other dimensions and the overall score indicates that both bachelor's and master's education students possess similar levels of future-thinking skills. This similarity could stem from the comparable academic focus and skill development at both educational levels, which emphasizes academic success rather than future-oriented thinking skills. Faculty and student activities might not sufficiently prioritize enhancing students' future thinking competencies regardless of their academic level.

Table 8: Independent Samples Test Results for Academic Level Differences at 0.05 Significance Level.

Dimension	Academic Level	N	Mean	Std. Deviation	Degrees of Freedom	t-Value	Significance	Significance Level
First Dimension: "Degree of Students' Possession of Future Planning Skills"	Bachelor's	165	2.611	0.422	181	2.536	*0.012	Significant
	Master's	18	2.34	0.507				
Second Dimension: "Degree of Students' Possession of Future Problem-Solving Skills"	Bachelor's	165	2.514	0.493	181	1.356	0.177	Not Significant
	Master's	18	2.347	0.512				
Third Dimension: "Degree of Students' Possession of Future Forecasting Skills"	Bachelor's	165	2.564	0.647	181	1.426	0.155	Not Significant
	Master's	18	2.333	0.686				
Fourth Dimension: "Degree of Students' Possession of Future Imagination Skills"	Bachelor's	165	2.476	0.56	181	1.4	0.137	Not Significant
	Master's	18	2.264	0.667				
Overall Score	Bachelor's	165	2.529	0.443	181	1.702	0.09	Not Significant
	Master's	18	2.337	0.556				
*Statistically significant at a level of 0.05								

To further examine the impact of all four study axes on the main axis representing future thinking skills required for students at Prince Sattam bin Abdulaziz University, multiple regression analysis was conducted by treating the four study axes as independent variables and the main axis as the dependent variable. The null hypothesis was formulated as "There is no significant effect of the study axes on the future thinking skills required for students at Prince Sattam bin Abdulaziz University," and the alternative hypothesis as "There is a significant effect of the study axes on the future thinking skills required for students at Prince Sattam bin Abdulaziz University." Table 9 presents the results of the multiple regression analysis.

To further explore the relationship between the four dimensions of future thinking skills and the overall level of these skills among students at Prince Sattam bin Abdulaziz University, multiple regression analysis was conducted. This method was chosen because it allows for simultaneous examination of the effects of multiple independent variables (four dimensions) on a single dependent variable (overall future thinking skills). Before conducting the analysis, the assumptions of linearity, homoscedasticity, and absence of multicollinearity were checked and found to be met.

Multiple regression analysis (Table 9) showed that the four study dimensions (independent variables) were good at predicting the thinking skills that Prince Sattam bin Abdulaziz University students would need in the future (dependent variable), with a value of $F(4, 178) = 2458.583$ and significance level of $p < 0.001$. The model explained 98.2% of the variance in the dependent variable (adjusted $R^2 = 0.982$), indicating a strong relationship between these dimensions and

overall future thinking skills. All four dimensions had significant effects on the dependent variable at the 0.05 level: future planning skills (β = 0.293, t = 19.184, p < 0.001), future problem-solving skills (β = 0.412, t = 25.543, p < 0.001), future forecasting skills (β = -0.040, t = -2.000, p = 0.047), and future imagination skills (β = 0.432, t = 18.496, p < 0.001). These results suggest that all four study dimensions are important predictors of the future thinking skills required of students at Prince Sattam bin Abdulaziz University, with future problem-solving and imagination skills having the strongest effects.

This research aimed to understand the relative contributions of the four dimensions to the overall level of future thinking skills, justifying the use of multiple regression analysis in this study. This method provides a more comprehensive understanding of the relationships between variables than simpler techniques such as correlation analysis. Furthermore, the large sample size (n=183) and high adjusted R^2 value support the reliability and validity of the findings.

Table 9: Multiple Regression Analysis.

R	R Square	Adjusted R Square	Std. Error of the Estimate		
0.991	0.982	0.982	0.06163		
Model	**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
Regression	37.357	4	9.339	2458.583	0.000**
Residual	.676	178	0.004		
Total	38.033	182			
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	-.008	.028		-.288	0.774
First Axis	.307	.016	.293	19.184	0.000***
Second Axis	.380	.015	.412	25.543	0.000***
Third Axis	-.028	.014	-.040-	-2.000	0.047*
Fourth Axis	.345	.019	.432	18.496	0.000***
**Statistically significant at the 0.001 level. *Statistically significant at p < 0.05.					

5. Discussion

The findings of this research have striking similarities and dissimilarities with previous research related to the Future-oriented thinking skills in educational communication of students at Prince Sattam bin Abdulaziz University. For instance, **Tan and Wong** (2020) also argue that students need to plan for the future in order to improve their comprehension and learning. Students have a better working experience when they are inspired to consider the future. **Levrini *et al.*** (2021) opine that parents and educators bear the additional responsibility of inspiring pupils to think in more directed ways. Teachers who are strongly driven to educate can create more effective lesson plans for their education students. **Mueller and Washington** (2022) advised that students should develop a thoughtful future-focused perspective that can impact their daily work. For education students, parental support in developing future-oriented thinking is equally important. According to **Marnı *et al.*** (2020), parents provide inspiration for their children's performance and way of thinking. The way the kids approached thinking about these goals came out well when they had a few objectives to meet. **Kwangmuang *et al.*** (2021) consider it imperative that kids exhibit motivation for their noteworthy conduct in order to progress towards future accomplishment. Furthermore, making plans for the future fosters' growth and the development of practical working methods in students. According to **Fitriani *et al.*** (2020), it is a helpful strategy for raising students' general behavior levels because it affects their academic achievement.

Yayuk and As' ari (2020) believe that students need to forecast the future in order to enhance their behavior and learning. It is important to expose the pupils to important directions that can affect their performance and learning of education students. According to **Simanjuntak *et al.*** (2021), many students are driven to pick up new abilities, they also need to be aware of the evolving trends that may affect their lives in the future. Improving learning performance and behavior for future employment is a crucial component for the pupils. According to **De Jaegere *et al.*** (2023), to enhance student outcomes, teachers and students must engage in extensive forecasting. By developing their talents, students are able to better their current situation through the gathering of information about changes that may occur in the future. **Maeda *et al.*** (2021) assert that it is a crucial strategy for the pupils, and it also has an impact on how they plan for the future. The kids' behavior is improved by the reliable forecasting method, which is essential for strategic working. **Ganzin *et al.*** (2020), too, agree that when educators inspire their pupils to advance their knowledge and abilities, they recognize the patterns of the future and make an effort to operate in line with them.

Rasa *et al.* (2022) advised that throughout their education, children should be exposed to several approaches to problem resolution. The kids' attitude to problem solving enables them to overcome various obstacles. According to **Fitriani *et al.*** (2020), with creativity in education, it is possible because motivated pupils are able to reliably handle big obstacles. In addition, kids need to learn the right approach to problem solving, but professors should inspire them to do all of this. **Kwangmuang *et al.*** (2021) consider higher levels of creativity in the classroom aid in kids' problem-solving abilities, which in turn helps them learn better and behave better. **Lee and Blankenship** (2021) also believe that pupils who lack motivation are less inventive in enhancing their learning habits. education students must change the way they behave because it will affect them in the long run. **Hashimoto *et al.*** (2022) assert that students receive dependable support that improves both their general conduct and learning abilities. Students' lack of motivation for studying has

become a major learning obstacle. **Sutiani *et al.*** (2021), too, advise that kids possess strong learning capabilities so they can solve challenges in the future by using creative thinking.

Students' learning in education college is significantly aided by their inventive thinking. According to **Chia** (2022), students who have a positive outlook on the future are better able to learn and perform. Students put forth a lot of effort to accomplish their goals when they are inspired about the future. **Yayuk and As' ari** (2020) agree to this premise and consider that pupils' intrinsic and extrinsic motivation are also very important for this goal. However, when pupils encounter substantial obstacles when studying, their learning performance improves. **Marnı *et al.*** (2020) believe that it aids in their creative development, which gives them the capacity to consider the future. Furthermore, future-focused thinking is an important component that helps kids significantly raise their performance. According to **Kwangmuang *et al.*** (2021), students can enhance their learning outcomes by strategically advancing their critical and creative thinking about the future. **Mueller and Washington** (2022) find that a key component of overcoming major obstacles is students' strong motivation to accomplish their goals. Moreover, intelligent pupils plan ahead creatively and put in a lot of effort to accomplish their objectives.

6. Conclusion

In conclusion, the study sample members rated the future thinking skills necessary for educational communication of students at Prince Sattam bin Abdulaziz University, with an overall questionnaire average of 2.510 and standard deviation of 0.457. The first axis, "the degree of students' future planning skills," ranked first with a high response level, averaging 2.585 with a standard deviation of 0.437. The third axis, "the degree of students' future forecasting skills," ranked second with a high response level, averaging 2.541 with a standard deviation of 0.652. The second axis, "the degree of students' future problem-solving skills," ranked third with a medium response level, averaging 2.497 with a standard deviation of 0.496. Lastly, the fourth axis, "the degree of students' future imagination skills," ranked fourth with a medium response level, averaging 2.455 with a standard deviation of 0.573. At a significance level of 0.05, there were no statistically significant differences in the opinions of the study sample members regarding the four questionnaire axes based on gender. Similarly, there were no statistically significant differences between study sample members' opinions on the four questionnaire axes based on educational level related to education students g, except for the first axis, which showed significant differences in future planning skills. Multiple regression analysis revealed that all four study axes explained 98.2% of the changes in the dependent variable, which are the future thinking skills that Prince Sattam bin Abdulaziz University students require. These changes were significant at the 0.05 level.

This study presents important theoretical and practical implications for educational communication and the enhancement of future thinking skills of education students. By evaluating the extent of future thinking skills among students at Prince Sattam bin Abdulaziz University and examining the correlation between these skills and variables such as gender and academic level, this study significantly contributes to the existing body of knowledge. It offers valuable insights that can guide future research, theoretical development, and educational practice. To assist university administrators and faculty members in designing and implementing professional development programs and curricular changes aimed at fostering future thinking skills among pre-service teachers, this study's findings highlight areas that may require additional support and training. Furthermore, this study informs the development of assessment tools and strategies for evaluating future thinking skills in educational settings, enabling educators to monitor student progress and adjust teaching approaches accordingly.

7. Limitations and Future Directions

This research has some limitations which should be addressed in future studies. Firstly, the scope of this research for data collection was limited to the Prince Sattam bin Abdulaziz University which is challenging for generalization of the findings. Therefore, the future studies are recommended to collect data from more than one university to diversify the findings. Secondly, this study has not used partial least square – structural equation model which is well-known technique to analyze the data. The future studies are recommended to collect data using Likert scale questionnaire and analyze it by using measurement model and structural model. This method is appropriate to analyze the data for research in future. It would be a significant way to analyze the data and report empirical relationships between the variables. Finally, this study considered educational communication; however, specific variables of educational communication were not considered. Therefore, future studies should consider educational communication as a process of exchange of facts, ideas, opinions by considering relevant variables.

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