UNIJERPS
Unizik Journal of Educational Research and Policy Studies VOL.20 (2);
July-December, 2025 https://unijerps.org
2023 Impact Factor: **6.834;** 2022 ***Impact Factor***: 5.156; ***2021 Impact Factor: 5.641;***
2020 Impact Factor: 5.355. *Indexing and Impact Factor URL: http://sjifactor.com/passport.php?id=21363*

RELATIONSHIP BETWEEN THINK-PAIR SHARE AND MOTIVATION IN CHEMISTRY CLASSROOM IN NIGER STATE

Omobolanle Arike Fatusi[1], Lasisi Nureni[2] and Maryam Muhammed Kolo[2]
1. Department of Science Education, National Open University of Nigeria, Headquarter Jabi-Abuja; afatusi@noun.edu.ng
2. Department of Science Education, Federal University of Technology Minna, Niger State; +2349032242838

ABSTRACT
The work examined the relationship between think-pair-share and motivation in chemistry classrooms in Niger State Nigeria, the work was guided by two objectives, two research questions and one hypothesis. The work adopted correlational research design. The sample size for the research was 115 chemistry students in Niger State, the research instrument were questionnaires on think pair share and motivation which were developed by researcher and validated by three experts across the universities in Niger State. The reliability of the questionnaires was determined using Cronbach Alpha which yielded 0.72 and 0.89. The data were gathered using these instruments, the data gathered was analyzed using special package for social sciences version 24 and research was answered using descriptive statistics that is mean, standard deviation and scatterplot while the hypothesis was answered using regression analysis. The analysis showed that chemistry students possessed from high to moderate motivation when taught using think pair share strategy also the regression analysis also shows that there is strong positive relationship between think pair share and motivation of chemistry students with Mean R square to be 0.667. The work recommended that Chemistry teachers should adopt and consistently apply the Think–Pair–Share strategy as part of their regular instructional methods. This will promote active student engagement, motivation and deeper conceptual understanding of chemistry topics. The Ministry of Education and teacher training institutions should organize workshops, seminars, and professional development programs to equip teachers with the skills needed to effectively implement cooperative learning strategies such as Think–Pair–Share.

Keyword: Think-Pair-Share, Motivation, Chemistry

Introduction
Collaborative learning strategies have gained prominence in modern classrooms because they encourage active participation, peer interaction and shared responsibility for learning outcomes. Among these strategies, Think–Pair–Share (TPS), introduced by Lyman in 1981, remains one of the most widely adopted due to its simplicity and effectiveness in fostering student engagement and deeper understanding of concepts (Mendo-Lazaro *et. al.*, 2022). TPS is structured in three phases: learners first reflect individually on a posed question or problem (think), then collaborate with a partner to discuss their ideas (pair), and

finally share their conclusions with the larger class (share). This sequence not only promotes reflection but also provides opportunities for articulation, peer correction and collaborative knowledge construction (Li, 2023).

In the chemistry, TPS is particularly relevant because it encourages students to verbalize their thought processes, test hypotheses in discussion with peers and refine their reasoning before presenting to a wider audience. Research has shown that TPS enhances motivation, communication and problem-solving skills, which are essential competencies for mastering chemistry concepts (Cooper, 2021). Moreover, TPS creates an inclusive learning environment by allowing every student to participate, thereby reducing classroom silence and teacher dominance (Loes, 2022).

Recent studies emphasize the effectiveness of TPS in improving both cognitive and affective outcomes. For example, students engaged in TPS demonstrated significantly higher achievement and retention compared to those taught using conventional lecture methods (Ridwan., 2020). Additionally, TPS enhances motivation, self-confidence and reduces anxiety since students initially share ideas with a partner before presenting to the larger group (Li, 2023). Its adaptability to online and blended learning environments also makes it a relevant strategy for 21st-century education (Mendo-Lazaro *et. al*.., 2022). Therefore, TPS stands as a vital collaborative learning strategy that bridges individual thinking with collective knowledge building, making it an effective pedagogical approach for contemporary classrooms and particularly beneficial in science education as a result of motivation in chemistry classroom.

Motivation has long been recognized as a central determinant of students' learning behaviours and academic outcomes. In educational psychology, motivation is broadly defined as the internal drive or external influence that initiates, directs, and sustains goal-directed behaviour (Ryan & Deci, 2020). In classroom contexts, motivation determines not only how much effort students are willing to invest in learning but also the quality of their engagement and persistence in the face of challenges (Deci & Ryan., 2022). Consequently, improving student motivation is a critical concern for educators, particularly in science education, where complex concepts often demand sustained effort and problem-solving skills.

Given these perspectives, motivation is not merely a supplementary factor in education but a fundamental driver of learning success. Understanding how to foster and sustain students' motivation is therefore essential for designing effective instructional strategies and ensuring meaningful educational experiences. Motivation is one of the most influential psychological constructs in learning, determining the extent to which students engage, persist, and achieve academically (Deci & Ryan, 2020). In chemistry classrooms, where abstract concepts and problem-solving are central, maintaining students' motivation is especially important for effective learning

outcomes (Cooper, 2021). Instructional strategies that emphasize student participation, autonomy, and collaboration are considered essential in stimulating intrinsic and extrinsic motivation (Loes, 2022).

Empirical studies in recent years reinforce the crucial role of motivation in academic success. For instance, motivated students have been shown to display higher achievement, improved critical thinking, and greater retention of knowledge compared to their less motivated peers (Tran, 2019). In chemistry classrooms, motivation not only improves cognitive performance but also enhances curiosity, problem-solving, and collaborative engagement (Ridwan, 2022). Moreover, motivation serves as a mediating factor between teaching strategies and learning outcomes, meaning that the effectiveness of innovative instructional approaches often depends on their ability to enhance learners' motivational levels (Li, 2023).

One such strategy is Think–Pair–Share (TPS), a widely used collaborative learning approach that requires students to first reflect individually on a question (think), then discuss with a peer (pair), and finally share their ideas with the class (share). This sequence not only enhances comprehension but also fosters active participation, peer support, and self-confidence (Li, 2023). From the perspective of Self-Determination Theory (SDT), TPS aligns well with the psychological needs of autonomy, competence, and relatedness, which are central drivers of motivation (Deci & Ryan, 2020). By allowing students to formulate their own ideas, test them in peer discussions, and gain recognition in group sharing, TPS provides multiple motivational touchpoints.

Empirical research supports the positive relationship between TPS and motivation. For example, Tran. (2019) found that TPS significantly improved students' motivation and critical thinking in science classes by providing opportunities for cooperative exploration and mutual feedback. Similarly, Cooper. (2021) reported that TPS enhanced learners' intrinsic motivation by increasing engagement and reducing classroom anxiety. Furthermore, Deci & Ryan (2020) highlighted the adaptability of TPS to digital and blended classrooms, showing that it motivates students to participate actively even in online learning environments.

Therefore, the integration of TPS in chemistry teaching is not only beneficial for cognitive development but also for strengthening students' motivational levels. By linking reflective thinking with collaborative interaction and class-wide recognition, TPS creates a supportive learning environment that encourages students to remain engaged, confident, and motivated

Purpose of the Study

The aim of this study is to evaluate relationship between think-pair share and motivation in chemistry classrooms in Niger State**.** The following objectives guided the study

1. Evaluate the level of motivation of chemistry students taught using thinking pair share
2. Find out the relationship between think pair share and motivation of chemistry students

Research Questions of the study

1. What is the level of motivation of chemistry students when taught using think pair share?
2. What is the relationship between the motivation of chemistry students when taught using think pair share?

Research Hypothesis

$H0_1$: There is no significant difference in the relationship between the motivation of chemistry students and think pair share strategy

Research Method

This work adopted correlational research design. The population for this study is all chemistry students in Niger State. Nigeria which comprises of three geopolitical zone The sample for this work was 115 using solving formular. The instrument used to collect data are Likert scale questionnaires on think pair share and motivation rated strongly agreed (SA), Agreed (A), Disagreed (D), Strongly Disagreed (SD) and Neutral. The instruments were validated by three experts one from department of Education foundation Ibrahim Babangida University, one from Industrial Technology Education, Federal University of Technology and Department of science education federal university of technology Minna Niger State. The reliability of these have been determined using Cronbach alpha which yielded 0.72 and 0.89. The data was collected using these instruments. The data collected were analyzed using descriptive and inferential statistics. The research questions were answered using mean, standard deviation, scatterplots and hypotheses was tested using regression analysis.

Results

Research Question One: What is the level of motivation of chemistry students when taught using think pair share?

To answer this research question, mean and standard deviation was calculated

Table1.1 Mean and Standard Deviation of Students Taught Using Think Pair Share in Niger State

S/N	Items	Mean	STD	Decision
1	I enjoy exploring new ideas and concepts during discussions with my partner	3.18	.39	Moderate
2	I find solving problems with my partner exciting and rewarding	3.46	.51	Moderate
3	I like hearing and understanding my classmates' perspectives during pair discussions	3.36	.65	Moderate
4	Working together with a partner helps me feel more engaged and interested in the topic.	3.46	.51	Moderate
5	I feel a sense of achievement when I learn something new during Think-Pair-Share activities	3.63	.49	High

6	I enjoy challenging myself to think critically during discussions	3.18	.53	Moderate
7	I feel energized when sharing my ideas with the class after pair discussions	3.27	.63	Moderate
8	I enjoy the moment when I understand a difficult concept after discussing it with a partner	3.27	.62	Moderate
9	I like thinking deeply about the topic during the 'think' stage before pairing with a classmate	3.63	.49	High
10	I feel proud when my ideas contribute to the overall class discussion and understanding	3.72	.45	High
11	I participate in Think-Pair-Share activities to earn praise or recognition from my teacher."	3.36	.49	Moderate
12	I work hard during pair discussions because I want my classmates to think highly of me	3.91	.29	High
13	I engage in the activity because I know my teacher expects me to contribute	3.73	.45	High
14	I share my ideas because it might improve my grades or performance evaluation	3.82	.39	High
15	I participate to avoid being criticized for not contributing during discussions	3.64	.49	High
16	I participate to avoid being criticized for not contributing during discussions	3.18	.73	Moderate
17	I put effort into discussions to perform better than my peers	3.46	.67	Moderate
18	I work hard during Think-Pair-Share activities because it will help me succeed in future assignments or tests	3.64	.49	High
19	I contribute because I don't want to let my discussion partner down	3.55	.51	High
20	I engage in class activities because I know my parents value my active participation	3.36	.49	Moderate

Table 1, 1 presents the mean and standard deviation of students' responses on motivation during Think-Pair-Share (TPS) instructional activities. The results indicate varying levels of motivation across the different motivational indicators. The overall responses show that students demonstrated moderate to high levels of motivation during the Think-Pair-Share class.

Items with high motivational levels (Mean = 3.50–3.91) include: I feel a sense of achievement when I learn something new during Think-Pair-Share activities (M = 3.63, SD = 0.49), I like thinking deeply about the topic during the 'think' stage before pairing with a classmate (M = 3.63, SD = 0.49), I feel proud when my ideas contribute to the overall class discussion and understanding (M = 3.72, SD = 0.45), I work hard during pair discussions because I want my classmates to think highly of me (M = 3.91, SD = 0.29), I engage in the activity because I know my teacher expects me to contribute (M = 3.73, SD = 0.45), I share my ideas because it might improve my grades or performance evaluation"* (M = 3.82, SD = 0.39), I participate to avoid being criticized for not contributing during discussions"* (M = 3.64, SD = 0.49), I work hard during Think-Pair-Share activities because it will help me succeed in future assignments or tests (M =

3.64, SD = 0.49), and I contribute because I don't want to let my discussion partner down (M = 3.55, SD = 0.51). These items suggest that students are strongly motivated by both intrinsic factors such as achievement, understanding and intellectual engagement and extrinsic factors, including teacher expectations, peer recognition and performance outcomes.

On the other hand, items with moderate motivation levels (Mean = 3.18–3.46) include those related to enjoyment of discussions, exploring new ideas, and sharing perspectives with peers. For instance, I enjoy exploring new ideas and concepts during discussions with my partner (M = 3.18, SD = 0.39) and I find solving problems with my partner exciting and rewarding (M = 3.46, SD = 0.51) reflect students' appreciation for collaborative learning, though with moderate intensity. Similarly, I enjoy challenging myself to think critically during discussions (M = 3.18, SD = 0.53) and I enjoy the moment when I understand a difficult concept after discussing it with a partner (M = 3.27, SD = 0.62) demonstrate moderate levels of cognitive engagement.

Overall, the mean values reveal that students were actively motivated during Think-Pair-Share activities, with higher motivation linked to both social reinforcement (peer and teacher recognition) and personal achievement motives. This finding underscores the effectiveness of the Think-Pair-Share instructional strategy in stimulating both intrinsic and extrinsic motivation among Chemistry students in Niger State.

Research Question Two: What is the relationship between the motivation of chemistry students when taught using think pair share

To show the relationship scatterplot was plotted as shown in figure 1.

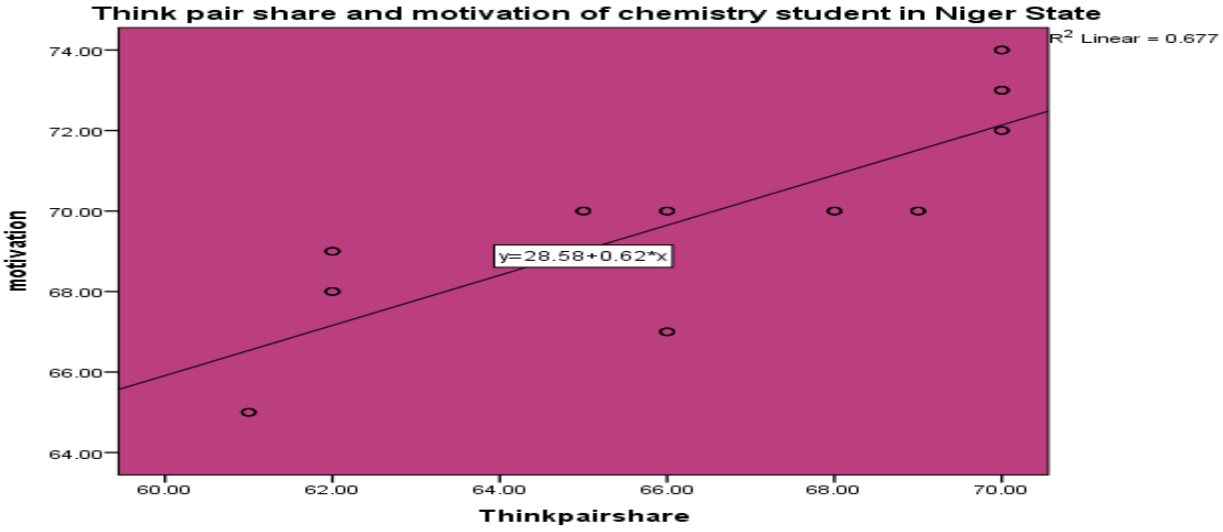


Figure 1: Scatterplot of Chemistry Motivation Taught Using Think Pair Share in Niger State

The scatterplot in Figure [1] illustrates the relationship between the Think-Pair-Share instructional strategy and the motivation of Chemistry students in Niger State. The analysis reveals a positive linear relationship between the two variables, as represented by the regression equation y = 28.58 + 0.62x. This indicates that for every one-unit increase in the use of the Think-Pair-Share strategy, students' motivation increases by 0.62 units.

Furthermore, the coefficient of determination (R^2 = 0.677) suggests that approximately67.7% of the variation in students' motivation can be explained by their participation in Think-Pair-Share activities. This finding demonstrates a strong positive correlation between the Think-Pair-Share strategy and students' motivation levels. The data points are closely aligned along the regression line, indicating consistency in the observed relationship and minimal presence of outliers.

The implication of this result is that the Think-Pair-Share strategy significantly enhances students' motivation to learn Chemistry. The interactive and collaborative nature of the approach where students think individually, discuss in pairs, and share with the class appears to promote active participation and sustained interest in learning. Consequently, greater engagement in Think-Pair-Share activities is associated with higher levels of motivation among Chemistry students in Niger State.

Research Hypothesis: There is no significant difference in the relationship between the motivation of chemistry students and think pair share strategy
A simple linear regression analysis was conducted to examine the relationship between Think-Pair-Share (TPS) instructional strategy and student motivation. The model summary is presented in Table 1.2

Table 1:2 Model Summary of the Regression Analysis on Think-Pair-Share and Motivation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.823[a]	0.677	0.666	1.45475

The result in Table 1 shows a correlation coefficient (R = .823) indicating a very strong positive relationship between the Think-Pair-Share strategy and students' motivation. The R Square value of .677 implies that 67.7% of the variance in students' motivation can be explained by the use of the Think-Pair-Share teaching strategy. This suggests that the model provides a very good fit to the data. The Adjusted R Square (.666), which corrects for sample size and number of predictors, is only slightly lower than the R Square value, confirming that the model's explanatory power remains strong and not inflated by sampling error. The standard error of the estimate (1.45475) indicates a relatively small average deviation of observed motivation scores from the predicted values, suggesting that the model predicts motivation with good accuracy.

Overall, the findings demonstrate that the Think-Pair-Share instructional strategy exerts a significant and strong positive influence on students' motivation, accounting for approximately 67.7% of the

variation in motivational outcomes. The result implies that students exposed to Think-Pair-Share are more likely to experience enhanced motivation compared to those who are not.

Table 1.3: Regression Analysis of Think Pair Share and Motivation

Model	Sum of Squares	Df	Mean Square	F	Sign
Regression	112.855	1	112.855	64.879	.000[b]
Residual	21886.803	115	190.320		
Total	21999.658	116			

a. Dependent Variable: motivation
b. Predictors:(constant), Think pair share

The analysis of the result presented in Table 3 shows the overall significance of the regression model. The regression sum of squares was 112.855 with 1 degree of freedom, while the residual sum of squares was 21,886.803 with 115 degrees of freedom, giving a total sum of squares of 21,999.658. The mean square values for regression and residual were 112.855 and 190.320, respectively. The model yielded an F-ratio of 64.879 with a corresponding significance value (p = .000).

This result indicates that the regression model is statistically significant at the 0.05 level, implying that the Think–Pair–Share instructional strategy made a significant contribution to the prediction of students' motivation during chemistry classroom activities. In other words, the Think–Pair–Share strategy reliably explains variations in students' motivation beyond what would be expected by chance.

Practically, this means that when students are engaged in Think–Pair–Share activities, their motivation toward learning chemistry increases significantly. The high F-value and very low p-value suggest that the model provides a good fit for the data, confirming that Think–Pair–Share strategy is an important determinant of students' classroom motivation in chemistry. Therefore, the null hypothesis which states that "Think–Pair–Share strategy has there is no significant relationship between think pair share and students' motivation during chemistry classroom activities is rejected.

Table Error! No text of specified style in document.**.6: Linear Regression Coefficient between Think Pair Share and Students' Motivation in Chemistry Classes**

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.
1	(Constant)	28.576154	5.126469		0.823	0.000
	Think pair Share	0.622308	0.077260	0.822603	8.06	0.000

a. Dependent Variable: Motivation

The coefficient table presents the extent and direction of the influence of the *Think–Pair–Share (TPS) strategy on students' motivation during chemistry classroom

activities. The unstandardized coefficient (B) for the constant was 28.576, with a standard error of 5.126, and it was statistically significant at p = 0.000. This indicates that when the Think–Pair–Share strategy is held constant at zero, the predicted baseline motivation score of students is 28.576.

The unstandardized coefficient (B) for the Think–Pair–Share strategy was 0.622, with a standard error of 0.077. This coefficient was also statistically significant at p = 0.000, with a t-value of 8.06, suggesting a strong positive relationship between the Think–Pair–Share strategy and students' motivation in chemistry. The standardized beta coefficient (β = 0.823) indicates that for every one standard deviation increase in the use of Think–Pair–Share activities, students' motivation increases by approximately 0.823 standard deviations.

This finding implies that the more teachers employ the Think–Pair–Share instructional approach, the higher the students' motivation levels during chemistry lessons. Therefore, the Think–Pair–Share strategy serves as a significant positive predictor of students' motivation in the chemistry classroom. Consequently, the null hypothesis stating that "Think–Pair–Share strategy has no significant relationship with students' motivation during chemistry classroom activities" is rejected.

Discussions

The present findings that Think-Pair-Share (TPS) evokes moderate to high motivation across both intrinsic and extrinsic dimensions can be meaningfully interpreted through the lens of Self-Determination Theory (SDT) and complementary social learning perspectives. According to SDT, individuals are more motivated when their basic psychological needs for autonomy, competence and relatedness are satisfied (Ryan & Deci, 2020). The think segment of TPS affords students autonomy to reflect independently, the pair stage fosters relatedness through collaborative discourse, and the share stage may bolster feelings of competence as students express understanding and receive reinforcement. Indeed, high scores in items reflecting achievement, peer recognition, and teacher expectations suggest that both intrinsic and extrinsic motivational sources are operating in tandem. Supporting this, cooperative and collaborative learning strategies more broadly have been shown to increase student engagement and motivation compared to lecture-based instruction (Tran, 2019; Loes, 2022).

Moreover, TPS aligns with Social Constructivist views which emphasize that meaning is co-constructed through interaction, and that social interaction enhances motivation by making learning more meaningful, relevant, and supported. By discussing ideas, debating alternative perspectives, and negotiating understanding, learners experience enhanced cognitive and affective investment. The convergence of SDT and social constructivist tenets suggests that TPS is effective because it simultaneously nurtures students' sense of agency, competence, and social connection thus creating a motivationally supportive environment for chemistry learning.

Based on the regression analysis, it is concluded that the Think–Pair–Share instructional strategy has a significant positive relationship with students' motivation during chemistry classroom activities. This suggests that the use of Think–Pair–Share enhances students' enthusiasm, interest, and active participation in learning chemistry, thereby fostering a more engaging and motivating classroom environment This finding corroborated findings of (Mendo-Lázaro *et al.,* 2022) and go against the findings of (Loes, 2022**).**

Conclusion

The findings revealed that the Think–Pair–Share (TPS) instructional strategy has a significant and positive relationship with students' motivation in chemistry classroom activities. This outcome demonstrates that when learners are actively engaged through cooperative dialogue and peer interaction, their enthusiasm, interest, and willingness to participate in learning tasks increase. The use of TPS encourages students to think critically, share ideas confidently, and learn collaboratively, which in turn fosters a stimulating and supportive learning atmosphere.

In essence, the implementation of the Think–Pair–Share strategy promotes not only cognitive understanding but also affective growth by enhancing students' intrinsic motivation toward chemistry learning. Teachers are therefore encouraged to incorporate the TPS approach regularly in their instructional practices to create learner-centered environments where students are more engaged, confident, and motivated to learn. These findings reinforce existing evidence that cooperative learning strategies like TPS are effective tools for improving students' motivation and overall classroom participation.

Recommendations

Based on the findings that the Think–Pair–Share (TPS) instructional strategy significantly enhances students' motivation during chemistry classroom activities, the following recommendations are made:

1. Chemistry teachers should adopt and consistently apply the Think–Pair–Share strategy as part of their regular instructional methods. This will promote active student engagement, motivation and deeper conceptual understanding of chemistry topics.
2. The Ministry of Education and teacher training institutions should organize workshops, seminars, and professional development programs to equip teachers with the skills needed to effectively implement cooperative learning strategies such as Think–Pair–Share.
3. Curriculum planners should incorporate collaborative learning techniques, including the TPS model, into the chemistry curriculum and teacher guides to promote learner-centered instruction and improve students' affective outcomes.
4. School administrators should provide conducive classroom environments that encourage interaction and collaboration among students. Adequate time and resources should

be allocated for pair and group discussions during lessons.

5. Future studies should explore the long-term effects of the Think–Pair–Share strategy on students' academic achievement, retention, and attitudes toward chemistry across different educational levels and contexts to strengthen the empirical support for its adoption.

REFERENCES

Cooper, K. M. (2021). Reconsidering the share of a Think–Pair–Share: Emerging perspectives on the 'share' phase. *Journal/Platform of Psychology of Education, 1(1), 32 - 43.*

Deci, E. L., & Ryan, R. M. (2020). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11(4), 227–268.

Li, J. (2023). Meta-analysis of student engagement and its influencing factors in higher education. *Journal of European Journal of Education, 3(4) 567- 579.*

Loes, C. N. (2022). The effect of collaborative learning on academic motivation. *Teaching & Learning Inquiry, 10(4). 112 – 124*

Mendo-Lázaro, S., León-del-Barco, B., Polo-del-Río, M.-I., & López-Ramos, V. M. (2022). The impact of cooperative learning on university students' academic goals. Frontiers in Psychology, 1(8), 23 -45.

Mundelsee, L. (2021). Think and pair before share: Effects of collaboration on achievement of Biology students in *Pakistan, Journal of Education Psychology, 4(5), 18-34.*

Ridwan, M. R. (2022). A meta-analysis of the effectiveness of a cooperative learning model. Participatory Educational Research, 6(1), 34 – 49.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78.

Tran, V. D. (2019). Does cooperative learning increase students' motivation? *International Journal of Higher Education*, 8(1). 39 – 52.