# Psychometric Factors and Undergraduate Students' Attitudes Towards Research: Evidence From Vietnam

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*Scientific research is an extremely important element in higher education. Nearly all undergraduate students at the university are required to take research courses in the formation process. Therefore, the current paper aims to explore Vietnamese undergraduate students' attitudes towards research. To measure attitudes towards research, the study used Papanastasiou's Revised Attitude Towards Research (R-ATR) scale (2014). This psychometric proprieties scale consisted of 13 items with three factors: research usefulness (4 items), research anxiety (5 items), and positive research predispositions (4 items). Data were collected by a questionnaire survey on a convenient sample of 520 undergraduate students from six universities in Vietnam. Descriptive and inferential statistics were used to analyze the data. The findings indicated that the students' attitudes were high in the factor of research usefulness and positive research predispositions. However, in the factor of anxiety, the attitudes were moderate. In addition, the public undergraduate students had significantly more positive attitudes towards research than the private undergraduate students. Similarly significant results were found for gender, year of study, and research experience.*

*Keywords: attitudes, undergraduate student, scientific research, research teaching, Vietnam*

## INTRODUCTION

Scientific research plays a very important role in higher education and life as a whole. Therefore, all academic majors in universities have research courses that aim to help students become better future readers or authors of scientific research. According to Circular 26 published by Vietnam's Ministry of Education and Training in 2021, which relates to the scientific activities of students in higher education, universities have to develop research capacity for students, support young researchers, and meet the requirements for training high-quality human resources for the country (Ministry of Education and Training of Vietnam, 2021).

Undergraduate students are given a chance to be more responsible for their learning process through research. Students are challenged to frame questions, develop a strategy for testing their propositions, and analyze data during research as an active learning process. The ability to support an argument and tolerate ambiguity is taught to students through scientific research. Furthermore, working as a research team member is also something students learn. Research frequently involves working in groups, having deeper

conversations with colleagues, and enhancing communication skills. Integration into the labor market later is dependent on these characteristics. Students develop their writing and presentation skills by presenting their work at conferences and poster sessions. Students' resumes and work applications are strengthened by publishing research papers and research experiences. However, scientific research largely depends on students' attitudes towards this activity. Attitudes are psychological dispositions expressed by judging a particular entity or object as favorably or unfavorably (Eagly & Chaiken, 2007). If they have a positive attitude, this activity will develop; however, if they have a negative attitude, it will be very limited. Therefore, to promote this activity with students, studying their attitudes towards scientific research is essential.

It is not a new idea to study undergraduate students' attitudes towards research. Indeed, numerous studies have been conducted worldwide to assess students' attitudes towards scientific research. Various studies have shown that students have a variety of attitudes toward research. While many students have positive attitudes toward scientific research, some have negative attitudes. The results of the study with South African students by Van de Westhuizen (2015) revealed that students expressed positive attitudes toward research, thinking that it would benefit them in their life, but deemed it difficult and expressed moderate anxiety about it. Research findings on nursing students showed that students had positive attitudes toward research and its usefulness in professional work but less positive attitudes towards research using research in practice (Halabi, 2016).

Research by Ünver et al., (2018) found that students who had participated in scientific activities held more positive attitudes toward research than those who had not. Students with prior experience doing scientific research showed more positive attitudes toward research and researchers than those without this experience. Another study in Rwanda showed that the students' attitudes were high in the factors of usefulness of research and the positive predispositions to research. The level of anxiety of research was moderate (Habineza, 2018).

In addition to studies that found positive attitudes toward research, many other studies have found negative attitudes toward research. Research by Mwiinga (2016) showed that 55% did not like research and 72.7% had poor attitudes. In their study, Monir and Bolderston (2009) pointed out the attitude and perception of students towards research. The study revealed that students have negative attitudes toward research, which causes them to have a general disinterest in conducting research. They argued that general disinterest in research is the most common reason students do not engage in research. Other studies also confirmed this finding (Oguan et al., 2014; Al Furaikh et al., 2017; Kumari et al., 2018).

By using Papanastasiou's (2005) Attitude Towards Research scale, Amoo & Gbadamosi (2021) found that approximately 63% of participants had a positive attitude toward research, while 37% had a negative attitude. Nonetheless, only 39% participated in research-related activities. Additionally, Obeidat & Obeidat's (2023) research on Jordanian architecture students revealed that most students had positive attitudes toward scientific research.

Through the literature review, previous studies on students' attitudes showed positive and negative attitudes toward scientific research. What are the attitudes of Vietnamese students towards scientific research? To answer this question, the author used Papanastasiou's scale to determine students' attitudes toward scientific research. To the best of our knowledge, no previous studies have surveyed students' attitudes towards scientific research using the Revised Attitudes Towards Research Scale (R-ATR; Papanastasiou, 2014) in Vietnam.

## MATERIAL AND METHODS

### Participants

A convenience sampling technique was used to obtain the research sample for this study. A total of 520 undergraduate students from six universities, including two private universities and four public universities in Vietnam, participated in the study. The survey questionnaires were distributed to students on their campus, and the average time to complete the questionnaire was approximately 10 minutes. Meanwhile,

the respondents were assured that their responses were anonymous because their names were not included in the questionnaire. Finally, the survey was offered in October 2022.

The participants' ages ranged from 18 to 24 years, with a mean of 19.45 years and a standard deviation of 1.17. Most of the students in the sample were female, 65.8% (n=342). Additionally, 130 (25.0%) were freshmen, 207 (39.8%) were sophomores, 122 (23.5%) were juniors, and 61 (11.7%) were seniors. In terms of academic ranking, the students with a very good academic performance comprise 136 (26.2%), good performers 224 (43.1%), fair performers 95 (18.3%), average performers 17 (3.3%), and others qualifications 48 (9.2%). A summary of the demographic information of the participants is shown in Table 1.

**TABLE 1**
**DEMOGRAPHIC INFORMATION OF RESPONDENTS**

| Variables | Values | N | % |
|---|---|---|---|
| Gender | Male | 178 | 34.2 |
| | Female | 342 | 65.8 |
| University | Open University | 100 | 19.2 |
| | Economics University | 100 | 19.2 |
| | Van Lang University* | 70 | 13.5 |
| | Social sciences & humanities University | 100 | 19.2 |
| | Hutech University* | 100 | 19.2 |
| | Natural sciences University | 50 | 9.6 |
| School year | Freshman | 130 | 25.0 |
| | Sophomore | 207 | 39.8 |
| | Junior | 122 | 23.5 |
| | Senior | 61 | 11.7 |
| Majors | Economics | 190 | 36.5 |
| | Natural sciences | 90 | 17.3 |
| | Social sciences | 144 | 27.7 |
| | Foreign language | 96 | 18.5 |
| Academic ranking | Very good | 136 | 26.2 |
| | Good | 224 | 43.1 |
| | Fairly good | 95 | 18.3 |
| | Average | 17 | 3.3 |
| | Others | 48 | 9.2 |
| Experience in conducting research | Yes | 131 | 25.2 |
| | No | 389 | 74.8 |
| Age | Mean = 19.45 | | |
| | SD** = 1.17 | | |

* Private university; ** Standard deviation

**Instrument**

A questionnaire survey collected data. The survey questionnaire consists of two parts. Part 1 of the questionnaire contained demographic information for the participants, while Part 2 focused on attitudes towards scientific research. To achieve the purpose of the study, the author used t*he Revised Attitudes Towards Research Scale (R-ATR) developed by* Papanastasiou in 2014. The Revised Attitudes Towards Research Scale (R-ATR) consists of 13 items measured on a 7-point Likert scale. A value of 1 indicates a response of "strongly disagree:, while a value of 7 indicates a response of "strongly agree". The 13 items in the R-ATR measure three lalent factors: Research usefulness (4 items), Research anxiety (5 items), and Positive research predispositions (4 items). Before data analysis, the negative wording items must be

reversed to obtain the scores. *According to* Papanastasiou's findings (2014), the reliability coefficients for the three factors have been reported as follows: "*research usefulness" (*Cronbach's alpha = 0.90), "*research anxiety" (*Cronbach's alpha = 0.86), and "*positive research predispositions" (*Cronbach's alpha = 0.92). The reliability of the whole scale was very high.

**Data Analysis**

Cronbach's alpha was used to determine the validity and reliability of the R-ATR scale. Afterward, the data were analyzed using t-tests, ANOVA, and Pearson correlations. Finally, the following analytical techniques were calculated using the Statistical Package for the Social Sciences (SPSS) version 25.

## RESULTS AND DISCUSSION

First, the scale's descriptive statistics were examined, including mean and standard deviation values. However, some items were recoded to indicate that a higher score for each item correlated with a positive attitude towards research. Table 2 shows the means and standard deviations of the 13 items included in the R-ATR scale.

**TABLE 2**
**DESCRIPTIVE STATISTICS OF THE R-ATR SCALE**

| Factors | Items | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Research usefulness | q1. Research is useful for my career | 5.22 | 1.62 | -0.54 | -0.43 |
| | q2. Research is connected to my field of study | 4.62 | 1.83 | -0.28 | -0.73 |
| | q3. The skills I have acquired in research will be helpful to me in the future | 5.18 | 1.71 | -0.62 | -0.52 |
| | q4. Research should be indispensable in my professional training | 4.46 | 1.76 | -0.17 | -0.63 |
| Research Anxiety | q5. Research courses make me anxious* | 3.66 | 1.76 | 0.12 | -0.64 |
| | q6. Research courses scare me* | 4.03 | 1.89 | -0.05 | -0.86 |
| | q7. Research courses are stressful* | 3.86 | 1.84 | 0.09 | -0.74 |
| | q8. Research courses make me nervous* | 4.98 | 1.82 | -0.52 | -0.66 |
| | q9. Research courses are difficult* | 3.41 | 1.74 | 0.26 | -0.61 |
| Positive research predispositions | q10. I enjoy my research course(s). | 4.13 | 1.61 | 0.02 | -0.26 |
| | q11. I love research courses. | 3.84 | 1.72 | 0.15 | -0.46 |
| | q12. I find research courses interesting. | 4.32 | 1.66 | -0.10 | -0.46 |
| | q13. Research courses are pleasant. | 4.85 | 1.60 | -0.25 | -0.43 |
| Overall attitude score | | 4.35 | 0.90 | -0.05 | 0.44 |

**Recoded items*

As shown in Table 2, the mean scores of the items ranged from 3.41 to 5.22 on a 7-point scale. All items had reasonable standard deviations that ranged from 1.60 to 1.89. The mean score of the overall scale for all participants was 4.35. As a result, the mean score of the overall scale in this study was slightly lower than that of previous studies (Habineza, 2018; Oducado, 2021).

Second, the scale's reliability was computed using Cronbach's alpha coefficient (α). The results were as follows: the reliability of the whole scale was 0.77, the reliability of the factor *"research usefulness" was 0.79, the reliability of the factor "research anxiety" was 0.80, and the reliability of the factor "positive research predispositions*" *was 0.83. According to these analyses, the reliability of the whole scale and of the three factors was lower than the results* reported for the original study (Papanastasiou, 2014), the Dutch adaptation study (Jansen et al., 2022), and that of the Spanish version of the R-ART (Loayza-Rivas & Icaza,

2023). However, according to Taber (2018), the Cronbach alpha coefficient should reach 0.70 for an instrument to have an acceptable level of self-consistency. Therefore, the reliability of the scale was still acceptable. Table 3 presents the Cronbach's alpha coefficient of the R-ATR scale.

**TABLE 3**
**MEANS, STANDARD DEVIATIONS AND RELIABILITY COEFFICIENTS OF THE R-ATR SCALE**

| | Mean | SD | Cronbach alpha coefficient (α) |
|---|---|---|---|
| R-ATR | 4.35 | 0.90 | 0.77 |
| Factor 1: Research usefulness | 4.87 | 1.37 | 0.79 |
| Factor 2: Research Anxiety | 3.99 | 1.36 | 0.80 |
| Factor 3: Positive research predispositions | 4.28 | 1.34 | 0.83 |

Additionally, the suitability of factor analysis for this sample was evaluated using the Kaiser–Meyer–Olkin measure of sampling adequacy (KMO) and Bartlett's test of sphericity. The KMO for this sample was 0.80 ($0.5 \leq KMO \leq 1$), and Bartlett's test of sphericity was statistically significant ($p < 0.000$), which gave sufficient justification to proceed with the factor analysis.

In terms of correlations, the Pearson correlation coefficient was used to determine the correlations between three factors of the R-ATR. The findings revealed that the factors "research usefulness" and "research anxiety" have a low negative correlation, which means that if undergraduate students have a high level of anxiety, they may find research less useful, and vice versa. In addition, there is a high positive correlation between "research usefulness" and positive research predispositions, which suggests that if undergraduate students consider research helpful, they are also likely to have a positive research disposition. This result is consistent with other studies (Rosas, 2020; Loayza-Rivas & Icaza, 2023). Correlations are shown in Table 4.

**TABLE 4**
**PEARSON CORRELATIONS BETWEEN THREE FACTORS OF THE R-ATR SCALE**

| Factors | Research usefulness | Research anxiety | Positive research predispositions |
|---|---|---|---|
| Research usefulness | 1 | -0.05 | 0.45* |
| Research anxiety | -0.05 | 1 | 0.12* |
| Positive research predispositions | 0.45* | 0.12* | 1 |

*. Correlation is significant at the 0.01 level (2-tailed).

Regarding gender, the independent-sample t-test was performed with test variables as three factors, and the grouping variable was gender (male/female). The findings showed no significant difference between male and female students. This result is similar to previous studies (Shaukat et al., 2014; Habineza, 2018; Nguyen et al., 2023). Their studies showed no significant differences in attitudes toward research between male and female students in Pakistan, Rwanda and Vietnam. Additionally, Hussain et al. (2016) found insignificant differences between male and female students' attitudes towards research.

The results for the relationship between scale scores and prior research experience are shown in Table 5. The mean scores of the three factors suggest that students with research experience were more positive than those without research experience. However, students with research experience showed greater scores than other students. This result may be explained by the fact that students with research experience were aware of the difficulties of scientific research.

**TABLE 5**
**T-TEST FOR COMPARISON OF MEAN SCORES OF STUDENTS' ATTITUDES BY PRIOR RESEARCH EXPERIENCE**

| Factors | Yes (n = 131) | | No (n = 389) | | | |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | t | p |
| Research usefulness | 5.22 | 1.42 | 4.75 | 1.33 | 3.422 | 0.001 |
| Research anxiety | 4.37 | 1.42 | 3.86 | 1.31 | 3.757 | 0.000 |
| Positive research predispositions | 4.48 | 1.41 | 4.22 | 1.31 | 1.961 | 0.050 |

In Vietnam, private university students are often viewed as less competent than public university students because of lower entrance scores. Does this affect their attitudes? Table 6 indicates that students from public universities have a much better perception of research usefulness than those from private universities. However, public university students have a higher level of research anxiety than private university students. This can be explained by the fact that students from public universities are more involved in research activities and, therefore, know about research difficulties.

**TABLE 6**
**T-TEST FOR R-ATR SCALE BETWEEN PUBLIC AND PRIVATE UNIVERSITY STUDENTS**

| Factors | Public (n = 350) | | Private (n = 170) | | | |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | t | p |
| Research usefulness | 5.00 | 1.36 | 4.60 | 1.35 | 3.139 | 0.002 |
| Research anxiety | 3.87 | 1.31 | 4.24 | 1.42 | -2.919 | 0.004 |
| Positive research predispositions | 4.25 | 1.29 | 4.35 | 1.45 | -0.747 | 0.455 |

To establish whether there was a relationship between different school year groups and attitudes towards research, a one-way analysis of variance (ANOVA) was conducted. The findings revealed that there was no significant difference between the different school year groups in terms of research usefulness and positive research predispositions. Nevertheless, there was a statistically significant difference in anxiety levels regarding scientific research, $F(3, 516) = 9.454$, $p < 0.000$, as shown in Table 7. Thus, junior and senior students have a higher level of research anxiety than freshmen and sophomores. This finding is consistent with Mutz & Daniel's research (2012). According to their research, younger students (freshmen and sophomores) have a highly optimistic view of research.

**TABLE 7**
**SCHOOL YEAR DIFFERENCES IN R-ATR**

| Factors | Freshman (n = 130) | | Sophomore (n = 207) | | Junior (n = 122) | | Senior (n = 61) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | F | p |
| Research usefulness | 4.72 | 1.36 | 4.94 | 1.39 | 4.92 | 1.21 | 4.87 | 1.61 | 0.72 | 0.54 |
| Research anxiety | 4.06 | 1.45 | 3.65 | 1.20 | 4.19 | 1.35 | 4.58 | 1.39 | 9.545 | 0.000 |
| Positive research predispositions | 4.42 | 1.37 | 4.21 | 1.28 | 4.35 | 1.41 | 4.13 | 1.37 | 1.03 | 0.37 |

In terms of the relationship between academic achievement and research attitudes, the findings showed no significant differences in students' attitudes towards research grouped according to academic achievement in this sample, as indicated in Table 8.

**TABLE 8**
**ANALYSIS OF VARIANCE (ANOVA)**

| Factors | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Research usefulness | Between Groups | 8.126 | 4 | 2.032 | 1.080 | 0.366 |
| | Within Groups | 968.862 | 515 | 1.881 | | |
| | Total | 976.988 | 519 | | | |
| Research Aixiety | Between Groups | 8.194 | 4 | 2.049 | 1.108 | 0.352 |
| | Within Groups | 952.030 | 515 | 1.849 | | |
| | Total | 960.224 | 519 | | | |
| Positive research predispositions | Between Groups | 14.294 | 4 | 3.574 | 1.982 | 0.096 |
| | Within Groups | 928.617 | 515 | 1.803 | | |
| | Total | 942.911 | 519 | | | |

According to the findings, there is a significant difference between those who decide to conduct scientific research in the future and those who do not. Students who conduct scientific research have a high level of research usefulness and positive research predispositions, and a lower level of research anxiety than those who do not conduct scientific research in the future.

## CONCLUSION

It is important to measure students' research attitudes, as it can impact how universities can adjust their education programs to improve their students' research productivity. This study explored undergraduate students' attitudes toward research using the Revised Attitudes Towards Research Scale (R-ATR, Papanastasiou, 2014). This scale is used for the first time in Vietnam in this study. The study revealed that the undergraduate students' attitudes towards research were high in the factors of usefulness of research and the positive predispositions to research. However, the levels of research anxiety were moderate. The results show that students' attitudes toward scientific research are influenced by gender, research experience, type of school, year of study, and future scientific research intentions.

The study contains many limitations. In particular, the type of sampling is the main limitation of the study because the sampling was nonprobabilistic. It is a challenge to generalize the results to the target population. Future research could overcome these limitations by using probability sampling.

Despite the limitations, this study introduces a new measurement instrument that utilizes a global approach to evaluate attitudes toward scientific research in Vietnam. Evidence of validity and reliability is reported in this study. Consequently, this scale can be utilized in future research on attitudes towards scientific research in Vietnam.

## ACKNOWLEDGMENTS

The authors thank the undergraduate students for participating in this survey.

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