International Journal of Multidisciplinary Research in Science, Technology and Innovation (IJMRSTI)
Vol. 10. No: 3. (April-June, 2026) www.ijmrsti.com ISSN: 3027-2734

Effects of Active Learning Strategy Approach on Students' Academic Achievement and Interest in Woodwork Technology in Niger State Technical Colleges

Mohammed Bala Maik[1] Musa Stephen[2] Udu Nehemiah[3] Kareem Wahab Bamidele[4]
Correspondence email address: balamohammed@futminna.edu.ng
Correspondence Phone Number: +234 802 491 6900
Department of Industrial and Technology Education
School of Science and Technology Education, Federal University of Technology, Minna

Abstract
The study investigated the effect of active learning strategy approach on students' academic achievement and interest in Woodwork Technology in Technical Colleges in Niger State. Two research questions and two null hypotheses were formulated to guide the investigation. A quasi-experimental design involving a non-equivalent pretest and posttest group structure was adopted for the study. The population of the study consisted of 65 TC II students offering Woodwork Technology across all Technical Colleges in Niger State. A simple random sampling technique was used to assign two colleges to Experimental Group I and the remaining two colleges to Experimental Group II. The instruments used for data collection were the Woodwork Technology Achievement Test (WTAT) and Woodwork Technology Interest Inventory (WTII). These instruments were validated by three experts from the Department of Industrial and Technology Education, Federal University of Technology, Minna. Reliability coefficients were established using appropriate statistical methods: KR-20 yielded 0.79 for WTAT, while Cronbach Alpha produced 0.86 for WTII, indicating acceptable internal consistency. The intervention lasted for eight weeks, during which five selected topics in Woodwork Technology were taught. A pretest was administered in the first week before the commencement of treatment for both groups. Data collected were analyzed using SPSS version 26. Research questions were answered using mean and standard deviation, while the hypotheses were tested using Analysis of Covariance (ANCOVA) at 0.05 level of significance. Findings from the study revealed that both active learning strategy and conventional lecture methods improved students' academic achievement in Woodwork Technology; however, active learning strategy proved to be more effective, recording a higher mean gain of 38.92. The study further indicated that active learning strategy positively influenced students' interest in Woodwork Technology. Based on these findings, it was recommended that Woodwork Technology teachers in Technical Colleges should adopt active learning strategy to enhance students' academic achievement and interest in the subject. In addition, the National Board for Technical Education (NBTE) should integrate active learning strategy approaches into the Woodwork Technology curriculum to improve instructional effectiveness in technical education.
Keywords: Active Learning Strategy, Woodwork Technology, Technical Colleges, Academic Achievement, Student Interest and Instructional Strategies

Introduction
Technical and Vocational Education and Training (TVET) is a vital component of education designed to equip learners with the knowledge, skills, competencies, and attitudes required for gainful employment in recognized occupations. The Federal Republic of Nigeria (FRN, 2014) outlines the objectives of TVET to include producing skilled manpower in applied sciences, technology, and business at craft and technical levels, and empowering individuals with employable and self-reliant skills. In Nigeria,

Technical Colleges serve as key institutions for delivering TVET at the intermediate level, training competent craftsmen and technicians in trades such as electrical installation, automobile mechanics, metalwork, and Woodwork Technology.

Woodwork Technology, as one of the major trade areas in TVET, is designed to equip students with relevant skills in the use of timber, woodworking tools, machines, and processes used in furniture making and construction industries. The programme aims at producing graduates who are competent in carrying out woodworking operations with precision and professionalism. According to NABTEB (2006), Woodwork Technology students are expected to demonstrate knowledge of timber properties, identification and use of woodworking tools and equipment, construction of furniture items, jointing techniques, surface finishing, and basic workshop practices. In addition, the programme develops learners' ability to interpret working drawings, apply safety measures in the workshop, and execute practical woodworking tasks effectively, thereby preparing them for employment or self-reliance in the woodworking and allied industries (David and Jude, 2017).

It is concerning that many graduates of Woodwork Technology produced from Technical Colleges across Nigeria do not possess the required practical competencies needed for effective performance in the woodworking and furniture industries. Okwelle and Ojotule (2018) observed that the intended objectives of vocational programmes appear not to be fully achieved, as a significant number of graduates are unable to carry out essential practical tasks after graduation, making them less employable. This situation has raised concern among parents and government who invest heavily in education but often do not see corresponding returns in terms of skilled manpower development. Teachers equally express dissatisfaction over students' poor academic performance in both internal and external examinations.

This trend is also reflected in students' performance in national examinations such as those conducted by the National Business and Technical Examinations Board (NABTEB), particularly in Woodwork Technology-related trades. Jimoh et al. (2022) attributed this poor performance partly to ineffective teaching methods adopted by instructors in technical colleges. Similarly, Lkama and Dabo (2019) noted that persistent reliance on conventional teaching approaches contributes significantly to students' underachievement in NABTEB examinations. One of the most commonly used traditional methods is the lecture method, which is largely teacher-centred, allowing the instructor to dominate classroom activities while students remain passive recipients of information.

Active learning strategy refers to the extent to which learners are able to actively manage, control, and take responsibility for their own learning processes. It involves the capacity to plan, monitor, and evaluate one's learning behaviours, emotions, and cognitive activities in line with set academic goals and situational demands (Kadivar et al., 2012). In the view of Tang (2012), active learning strategy is a purposeful and active process in which learners set learning objectives and deliberately regulate their cognition, motivation, and behaviour in order to achieve these goals within a given learning environment. It integrates metacognitive awareness, strategic planning, self-monitoring, and self-evaluation, all of which enable learners to take control of their academic progress. In this approach, learners are aware of their strengths and weaknesses and are able to apply appropriate learning strategies to overcome academic and practical challenges (Akudo, 2018). This learner-centred process contrasts sharply with the conventional lecture method, where students are often passive recipients of knowledge, thereby limiting active engagement and practical skill development in Woodwork Technology.

Academic achievement, on the other hand, refers to the extent to which learners successfully perform in assessment tasks or examinations. It is often measured through test scores that reflect students' mastery of subject content (Adegunle, 2016). It also represents the level of attainment of intended learning objectives in terms of knowledge and skill acquisition (Abuhassna et al., 2020). In Technical Colleges, students' achievement in Woodwork Technology indicates the quality of instructional delivery and the effectiveness of learning processes. Poor achievement, however, may be linked to inadequate motivation and ineffective learning approaches.

Interest is the level of curiosity, enthusiasm, and willingness a learner shows toward a subject or activity (Abuhassna et al., 2020). In Woodwork Technology, interest reflects students' eagerness to participate in workshop practices, understand tools and processes, and engage in skill-based tasks. Students who show interest are more likely to actively participate in learning activities, sustain attention, and overcome challenges (Akudo, 2018). Ezenwafor et al. (2020) further emphasized that interest is naturally developed and sustained through effective instructional strategies that make learning meaningful and engaging.

Statement of the Research Problem

Developing cognitive understanding and psychomotor skills in Woodwork Technology is essential for sustainable economic growth, as the programme is designed to produce competent craftsmen capable of carrying out various workshop and construction-related operations (Adegunle, 2016). However, students' performance in the trade has remained generally poor due to several challenges such as inadequate attention to trade-specific instructional needs, insufficient workshop facilities, and the continued use of ineffective teaching methods (Ezenwafor et al., 2020). Despite ongoing investment in technical education in Nigeria, evidence from the National Business and Technical Examinations Board (NABTEB) Chief Examiner's reports from 2019 to 2023 reveals a persistent decline in students' performance in Woodwork Technology, with recorded failure rates of 51.13%, 43.14%, 47.07%, 30.56%, and 50.01% respectively. This poor performance has been largely attributed to the dominance of the lecture method, which encourages rote memorization and passive learning, thereby limiting students' active engagement in meaningful skill acquisition. In such a teacher-centred environment, learners are rarely given opportunities to set learning goals, monitor their understanding, or regulate their cognitive and practical activities, which are essential components of effective skill development. Consequently, there is a growing need for more learner-centred instructional approaches that promote metacognition, strategic learning, and self-motivation. Active learning strategy offers such an alternative, as it enables students to take control of their learning by planning, monitoring, and evaluating their progress, thereby enhancing both understanding and practical competence. Against this background, the study therefore seeks to determine the effect of active learning strategy approach on students' academic achievement and interest in Woodwork Technology in Technical Colleges in Niger State?

Aim and Objectives of the Study

The aim of the study is to determine the effects of active learning strategy and lecture methods on students' academic achievement and interest in Woodwork Technology in technical colleges in Niger State. Specifically, the study sought to examine the:

1. Effect of active learning strategy and lecture methods on students' achievement in Woodwork Technology,

2. effect of active learning strategy and lecture methods on students' interest in Woodwork Technology.

Research Questions

The following research questions guided the study.

1. What are the effects of active learning strategy and lecture methods on students' achievements in Woodwork Technology?
2. What are effects of active learning strategy and lecture methods on students' interest in Woodwork Technology?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance to guide the study:

HO_1: There is no significant difference between the mean achievement scores of students taught Woodwork Technology using active learning strategy and lecture methods

HO_2: There is no difference between the mean interest scores of students taught Woodwork Technology using active learning strategy and lecture methods

Methodology

The study adopted a quasi-experimental research design and was conducted in Niger State, focusing on 65 TC II students offering Woodwork Technology in four Technical Colleges during the 2024/2025 academic session, with no sampling since the entire population was used. Two instruments were developed and utilized for data collection, namely the Woodwork Technology Achievement Test (WTAT) and Woodwork Technology Interest Inventory (WTII), alongside two sets of lesson plans designed for the active learning strategy and lecture method respectively. All instruments and lesson plans were validated for face and content relevance by three experts from the Department of Industrial and Technology Education, Federal University of Technology, Minna, while their reliability was established through a trial test involving 20 TC II Woodwork Technology students from Government Technical College, Malali, Kaduna State. A one-day training programme was organized for four research assistants to ensure proper implementation of the instructional procedures. The study was carried out in three stages comprising pre-test, treatment, and post-test, while extraneous variables such as the Hawthorne effect, test familiarity, and group interaction were controlled to ensure validity of findings. Initial group differences were adjusted using Analysis of Covariance (ANCOVA), and only one group was assigned per school to prevent contamination between groups. Data were collected by the researcher with the assistance of trained research assistants and analyzed using SPSS version 26.0, where mean and standard deviation were used to answer research questions, while ANCOVA was employed to test the null hypotheses at 0.05 level of significance.

Results and Analysis

Research Question 1: What are the effects of active learning strategy and lecture methods on students' achievements in Woodwork Technology?

Table 1: Summary Statistics of Students' Pretest and Posttest Scores Taught woodwork technology with Active learning strategy and Lecture Methods

Teaching Method	N	Pretest Score $\overline{X}$	Posttest Score $\overline{X}$	Mean Gain $\overline{X}$

Active learning strategy	35	20.68	59.60	38.92
Conventional Method (Lecture)	30	17.50	52.49	34.99

Table 1 shows that the treatment group taught woodwork technology with active learning strategy had a mean score of 20.68 in the pretest and a mean score of 59.60 in the posttest making a pretest, posttest mean gain in the treatment group taught with active learning strategy to be 38.92. The treatment group taught woodwork technology with lecture method had a mean score of 17.50 in the pretest and a posttest mean of 52.49 with pretest, posttest mean gain of 34.99. With these results, both active learning strategy and lecture methods are feasible to enhance students' achievements in Woodwork Technology, but the impact of active learning strategy on students' achievements in Woodwork Technology is greater than that of lecture method.

Research Question 2: What are effects of active learning strategy and lecture methods on students' interest in Woodwork Technology?

Table 2: Summary Statistics of Students' Interest Inventory Scores Taught woodwork technology with Active learning strategy and Lecture Methods

Teaching Method	**N**	**Pretest Score** $\overline{X}$	**Posttest Score** $\overline{X}$	**Mean Gain** $\overline{X}$
Active learning strategy	35	2.30	4.28	1.98
Conventional Method (Lecture)	30	2.40	4.18	1.78

Table 2 shows the interest inventory scores of students on woodwork technology using with active learning strategy and lecture methods. Data on active learning strategy had interest inventory scores (pre-test 2.30 and post-test 4.28) with interest inventory difference of 1.98. Data on lecture method had interest inventory scores (pre-test 2.40 and post-test 4.18) with interest inventory difference of 1.78. From these results, each teaching methods indicated significant increase in academic interest of the students but active learning strategy method had the highest performance, indicates that students' interest in woodwork technology was on the high when taught using active learning strategy method.

Hypotheses Testing

HO_1: The result of hypothesis one which states that there is no significant difference between the mean achievement scores of students taught Woodwork Technology using active learning strategy and lecture methods is presented in Table 3.

Table 3: Analysis of Covariance (ANCOVA) Showing the Result of Hypothesis One

Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	385.220[a]	2	124.508	13.664	.004
Intercept	5245.119	1	4201.949	220.420	.001
Pretest	82.604	1	82.604	4.105	.045
Strategy	165.480	1	185.512	7.480	.007
Error	3258.738	63	22.715		

Total	162248.000	66
Corrected Total	4082.074	65

***Significant at F<0.05**

Table 3 shows that with respect to the achievement mean scores of students taught woodwork technology using active learning strategy and those taught with lecture method, an F-ratio of 7.480 was obtained with associated exact probability value of .007. Since the associated probability value (.007) is less than 0.05 set as level of significance for testing the hypothesis, this means that the null hypothesis (H_{O1}) which stated that there is no significant difference between the mean achievement scores of students taught Woodwork Technology using active learning strategy and those taught with lecture method is rejected. Inference drawn is that there is a significant difference between the mean achievement scores of students taught woodwork technology using active learning strategy and those taught with lecture method. This result showed that students' academic achievement improved in woodwork technology when taught using active learning strategy than students taught using lecture method.

HO_2: The result of hypothesis three which states that there is no difference between the mean interest scores of students taught woodwork technology using active learning strategy and lecture methods is presented in Table 4.

Table 4: Analysis of Covariance (ANCOVA) Showing the Result of Hypothesis Three

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	0.85[a]	2	101.658	.322	.001
Intercept	69.108	1	3802.710	340.833	.002
Pretest motivation	.095	1	.095	.611	.001
Strategy	. 003	1	. 003	.016	.004
Error	32.100	63	.668		
Total	2384.043	66			
Corrected Total	32.105	65			

***Significant at F<0.05**

Table 4 shows that with respect to the interest mean scores of students taught woodwork technology using active learning strategy and those taught with lecture method, an F-ratio of 0.661 was obtained with associated exact probability value of .001. Since the associated probability value (.001) is less than 0.05 set as level of significance for testing the hypothesis, this means that the null hypothesis (H_{O3}) which stated that there is no significant difference between the mean interest scores of students taught Woodwork Technology using active learning strategy and those taught with lecture method is rejected. Inference drawn is that there is a significant difference between the mean interest scores of students taught woodwork technology using active learning strategy and those taught with lecture method. This result showed that active learning strategy improved students' interest in woodwork technology more than lecture method.

Discussion of Findings

The findings relating to research question one revealed that both active learning strategy and lecture methods improved students' academic achievement in Woodwork Technology. However, students exposed to active learning strategy performed

significantly better in the achievement test than those taught using the lecture method. The analysis further showed a significant effect of instructional approach on students' achievement, as the calculated F-value of 7.480 with a significance level of .007 was lower than the 0.05 level of significance. This implies that a significant difference existed between the achievement scores of students taught Woodwork Technology using active learning strategy and those taught using lecture method. The finding agrees with Yigzaw and Fentle (2013), who reported that active learning strategy positively influenced students' reading achievement in Ethiopian secondary schools. It also aligns with Nwafor et al. (2015), who found that active learning strategy enhanced students' achievement in Basic Science more effectively than conventional teaching methods. Similarly, Oruc and Arslan (2016) revealed that active learning strategy improved students' reading comprehension and metacognitive thinking skills. However, the finding contradicts Ejelue (2017), who found no significant difference between students taught Biology through active learning strategy and those taught through peer learning. Despite this contradiction, the findings of the present study indicate that active learning strategy is more effective in improving students' achievement in Woodwork Technology than lecture method.

The findings on hypothesis one further revealed a significant difference between the mean achievement scores of students taught Woodwork Technology using active learning strategy and those taught with lecture method. This finding supports Akudo (2023), who reported a significant difference in favour of students taught Chemistry using active learning strategy. It also agrees with Ateş-Akdeniz (2023), who observed improved academic achievement among students exposed to active learning strategy in a design studio course. The consistency of these findings indicates that active learning strategy plays a significant role in enhancing students' academic achievement in Woodwork Technology.

Findings on research question three revealed that although both instructional approaches improved students' interest in Woodwork Technology, active learning strategy was more effective. This finding agrees with Ateş-Akdeniz (2023), who found that active learning strategy improved students' interest and performance in studio design courses. Likewise, Akudo (2023) reported that active learning strategy positively influenced students' achievement and attitude toward Chemistry, thereby increasing their interest in learning. However, Ejelue (2017) found that peer learning had greater influence on students' interest in Biology than active learning strategy, possibly due to the collaborative nature of peer learning and differences in subject areas.

The findings on hypothesis two further revealed a significant difference between the mean interest scores of students taught Woodwork Technology using active learning strategy and lecture methods. This result aligns with findings by Ateş-Akdeniz (2023), Olakanmi and Gumbo (2017), and Akudo (2023), all of whom reported significantly higher interest levels among students taught using active learning strategy strategies. These consistent findings provide support for the effectiveness of active learning strategy in stimulating students' interest in Woodwork Technology. The overall findings therefore affirm that active learning strategy is more effective than lecture method in improving students' academic achievement and interest in Woodwork Technology in Technical Colleges.

Conclusion

Based on the findings and discussions of this study, it was concluded that both active learning strategy and lecture methods positively influenced students' academic achievement and interest in Woodwork Technology in Technical Colleges in Niger State. However, active learning strategy was found to be more effective than the lecture method.

The study therefore concludes that active learning strategy provides students with greater opportunities to actively participate in the learning process, regulate their pace of learning, and monitor their academic progress, thereby making learning more engaging and meaningful. The strategy also promotes active involvement and practical interaction, which enhance students' understanding and concentration in Woodwork Technology. Consequently, although both instructional methods are useful, active learning strategy remains the more effective approach for enhancing students' academic achievement and interest in Woodwork Technology in Technical Colleges.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Woodwork Technology teachers in Technical Colleges should adopt active learning strategy in the teaching of Woodwork Technology course contents in order to improve students' academic achievement in the trade.
2. The National Board for Technical Education should incorporate active learning strategy into the Woodwork Technology curriculum to enhance students' academic achievement and interest in the subject.
3. Government and other stakeholders in education should improve the provision of workshop facilities, instructional materials, tools, and equipment necessary for the effective implementation of active learning strategy in Woodwork Technology, thereby increasing students' interest in the trade.
4. Administrators of Technical Colleges should organize seminars, workshops, and training programmes for teachers and students on the effective use of active learning strategy in order to improve students' academic achievement and interest in Woodwork Technology.

References

Abdullah, B. W. (2023). Integration of employability skills in TVET trainer training programme: trainerrs readiness in teaching employability skills. Doctoral dissertation, Universiti Tun Hussein Onn, Malaysia.

Abuhassna, H., Al-Rahmi, W. M., Yahya, N., Zakaria, M. A., Kosnin, A. M., & Darwish, M. (2020). Development of a new model on utilizing online learning platforms to improve students' academic achievements and satisfaction. *International Journal of Educational Technology in Higher Education*, 1 (7), 1-23.

Adegunle, J. G. (2016). Constructivist Practices through guided discovery approach: The effect on students' cognitive achievement in Nigeria secondary school physics. *Eurasian Journal of Physics and chemistry Education, 2(1). 16-25.*

Akir, R. T., Boyle, E. A., Duffy, T., & Donleavy, K. (2012). Learning styles and academic outome: The validity and utility of vermants inventory of learning style in a British Higher Education setting. *British Journal of Educational Psychology.* 73(2), 267 – 290.

Akudo, C. O. (2018). Effects of active learning strategy strategy on chemistry students'achievement and attitude in senior secondary schools in delta north senatorial district.

Akudo, C. O. (2023). Effects of active learning strategy strategy on chemistry students' achievement and attitude in senior secondary schools in delta north senatorial district. Unpublished postgraduate dissertation submitted to the postgraduate school from the Department of Science Education, Faculty of Education, Delta State University, Abraka

Aliyu, I. L. (2023). Enhancing national development by advancing technical and vocational education in Nigeria to foster human capital development. *International Journal of Education, Culture, and Society*, *1*(1), 86-99.

Amuthavalli K., & Sivakumar A. H. (2014). The effect of computer assisted instruction with simulation in science and physics activities on the success of student. Electric current. *Eurasian Journal of Physics and Chemistry*. Retrieved from http://www.eurasianJournals.com/index.php/ejpce. 27th April, 2014

Ateş-Akdeniz, A. (2023). Exploring the impact of active learning strategy intervention on students' strategy use and performance in a design studio course. *International Journal of Technology and Design Education*, 33(2), https://doi.org/10.1007/s10798-022-09798-3

David, U. E., & Jude, L. P. (2017). Collaborative learning in bricklaying/concrete works and skills acquisition by technical college students in Akwa-Ibom State. *International Journal of Innovative Information System*, *8*(3), 45-58.

Ejelue, V. I. (2017). Relationship between secondary school students' active learning strategy skills and academic achievement scores in biology in Onitsha education zone. Unpublished M.Ed Thesis Submitted to the Department of Science Education, Faculty of Education, NnamdiAzikwe University, Awka.

Eze, T. I., Onwusa, S. C., Olumoko, B. O., & Sanni, R. A. (2020). Effectiveness of constructivism instructional method on students' psychomotor achievement, problem-solving and retention in Mechanical engineering craft practice in technical colleges. *Advances in Social Sciences Research Journal*, *7*(12), 135-148.

Ezenwafor, J. I., Okoye, K. R. E., & Obi, C. O. (2020). Relative effectiveness of demonstration and project-based teaching methods in developing students' psychomotor skills and interest in electrical installation and maintenance work. *The International journal of science & technology*, 8(1). https://doi.org/10.24940/theijst/2020/v8/i1/ST2001-009

Federal Republic of Nigeria (2014). *National Policy on education,* Revised Edition, Lagos, NERDC Press.

Igboko, K. O. & Ibeneme, O. T. (2016). Effects of some cognitive constructivist instructional approaches on student's achievement and retention in the study of introductory technology in Nigeria. *Journal of science teachers association of Nigeria,* 41(172), 37-43

Jimoh, J. A., Abd-El-Latif Adekunle, A. E., & Oguche, I. O. (2022). Students' attitude Towards and Interest in Building/Engineering Drawing: A Case Study. *Nigerian Online Journal of Educational Sciences and Technology*, *4*(2), 118-132.

Kadivar, P., Manzari, T. V., & Sarami, T. (2012). Relationship between active learning strategy skills with academic achievement: A meta-analysis. Retrieved From http//:www.google.com/recent-advances-on-educational-technologies/123-06.

Nwafor, C. E., Obodo, A. C., & Okafor, G. (2015). Effect of self regulated learning approach on junior secondary school students' achievement in basic science. *Journal of Education and practice*, 6(5), 78-92.

Okwelle, P. C., & Ojotule, D. I. (2018). Constraints to Students' Effectiveness in Practical Skills Acquisition in Technical Colleges in Kogi State, Nigeria. *International Journal of Innovative Scientific & Engineering Technologies Research, 6*(1), 1-9.

Olakanmi, E. E., & Gumbo, M. T. (2017). The effects of active learning strategy training on students' metacognition and achievement in chemistry. *Open Journal Systems*, 25(2), 161-170.

Oruc, A., & Arslan, A. (2016). The impact of active learning strategy on reading comprehension and attitude towards Turkish course and metacognitive thinking. *Educational Research and Reviews*, 11(8), 523-529. doi:10.5897/ERR2016.2692.

Osuyi, O., & Anthony, A. U. (2018). Effect of demonstration teaching mehtod on students'academic performance in basic electricity in technical colleges in edo state. *Journal of Education in Developing Areas*, *26*(2), 703-712.

Wigfield, A. (2023). The role of children's achievement values in the self-regulation of their learning outcomes. In *Self-regulation of learning and performance* (pp. 101-124). Routledge.

Yigzaw, A., & Fentle, A. (2013). The impact of students' self-regulated language learning on their reading achievement in Ethiopian high schools: Grade 9 in focus. *Journal of Media and Communication Studies*, 5 (5), 4451.doi:10.5897/JMCS2013.0345.