Unizik Journal of
STM Education Volume 9 Issue 1
ISSN: 1597-8249

# PERCEIVED INFLUENCE OF AN INTERACTIVE PERIODIC TABLE SOFTWARE ON STUDENTS' ACADEMIC ACHIEVEMENT AND RETENTION IN CHEMISTRY IN ONITSHA NORTH L.G.A

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**Abstract**

Students face difficulties in understanding periodic table concepts, leading to poor achievement and retention. To address the problem, so many teaching methods have been used. Although interactive tools have been shown to improved learning, but their effect on retention and actual usage is not well established therefore, this study investigated the perceived influence of Interactive periodic table software on students' academic achievement and retention in Onitsha North L.G.A. Gender difference was also considered. The study adopted a descriptive survey design and was conducted among 200 senior secondary school student 1(SS1), Data were collected using a structured questionnaire with a reliability value of 0.85 and analyzed using mean and standard deviation to answer the research questions. The findings revealed that students use the IPTS to a high extent in learning elements. The result also showed that use of the ITPS enhances students' academic achievement and improves their retention of learned concept. Furthermore, the findings indicated that both male and female are positively influenced. Though male slightly retained learned concepts more than female. Based on the findings of the study, it was concluded that ITPS is a good instructional tools for improving students; learning outcome in chemistry. Teachers are encouraged to integrate ITPS into teaching and school management should provide the necessary tools to support their use in the classroom.

**Key words:** Interactive Periodic Table Software Students' Achievement; Retention; and Gender

## Introduction

Chemistry is seen as interconnecting subject between physical sciences and other life sciences. It plays a vital role in every field of Education, ranging from medicine and environmental science to engineering and agriculture. Understanding chemical processes helps in the processing of life-saving drugs, cleaner energy, sustainable agricultural practices, and innovative materials (Hill and Kolb, 2020). Chemistry, therefore, is not just a discipline requirement but a basic necessity. It fosters problem-solving, logical reasoning, and experimental design skills that are relevant across multiple disciplines. However, its abstract nature makes it one of the most challenging subjects for students (Gabel, 2019). It is important to note that proper understanding of chemistry concepts and principles lies mostly on the knowledge of the periodic table, which serves as the primary framework for organizing and understanding chemical elements.

Unizik Journal of
STM Education Volume 9 Issue 1
ISSN: 1597-8249

Periodic table is scientific model that organizes elements according to atomic number and chemical properties. The periodic table according to Brown and Murphy, (2018) is defined as a tabular arrangement of all known chemical elements organized on the basis of their atomic number, electron configuration, and recurring chemical properties. It is not just a visual aid but a conceptual framework that brings order and predictability to the complexity of chemical behavior. Through the periodic table, learners can understand trends such as atomic radius, electro negativity, group of element and ionization energy, and how elements are arranged, which are essential in predicting element behavior and reaction outcomes. However, the way elements are arranged in the periodic table is confusing and abstract in nature. Students find it difficult to interpret, especially those who struggle with spatial and conceptual thinking. Mastery does not only rely on the familiarity with its layout but also a deep understanding of the principles it embodies The study of chemistry, particularly the understanding of elements and their properties, is fundamental to science education at large.. However, many students struggle with retention and academic achievement in this area due to the abstract and complex nature of the periodic table.

Students are expected to develop a strong foundation in chemistry to effectively apply scientific concepts to everyday activities. However, if students have difficulty retaining and applying their knowledge of the periodic table, it can negatively impact their overall academic success and future careers. These challenging or deficiency could attribute to the teaching method used by teachers in classrooms. Such as conventional teaching methods like lecture method, discussion, field trips and demonstration method. Conventional teaching methods which are mostly used by teachers rely heavily on rote memorization and passive learning; have proven insufficient in helping students grasp the relationships between elements, periodic trends, and their real-world applications.

Under these methods, chemistry teachers heavily relied on static charts, diagrams, and verbal explanations to teach periodic trends. These provided basic structure; they often emphasized rote memorization over conceptual understanding. Students found it challenging to visualize relationships between elements, apply periodic laws in problem-solving, and connect abstract information to real-life applications. This limitation frequently resulted in low retention

and give raise to poor academic achievement in chemistry and related tasks (Eze & Aja, 2024). Based on these challenges, technology began to offer new opportunities for transforming how the periodic table was taught and understood to easy way and better understanding. These technological opportunities emerged some software applications that gives learners clear views of element's arrangement. One of the software is the use of interactive periodic table software (computer-based platforms) that go beyond static charts to provide engaging, dynamic, and user-friendly learning experiences.

An interactive periodic table Software (IPTS) is a computer-based periodic table that allows users to explore elements and their properties by interacting with them. According to Smith and Thompson (2021), it is defined as a digital representation of the printed periodic table that incorporates multimedia features such as clickable elements, animations, embedded videos, and real-time visualizations of periodic trends to facilitate active learning and student engagement. Smith and Thompson further describe it as a technology-enhanced instructional tool that transforms abstract concepts into concrete, visual, and interactive learning experiences. It has the following features which include; clickable elements which helps the user to see detailed information about the element. Visual models that atomic structures and electron shells and their functions. This is a great tool for chemistry education and research that helps students understand properties of elements better. In the same vein, Nja and Okri (2025); Mokiwa(2017) discovered in their studies that use of the periodic Table Apps enable students to describe specific properties, characteristics, and constituent particles of chemical elements. Also recognize the significance of atoms and molecules and promote their understanding. Beyond comprehension, such tools also influence how well students retain learned concepts over time.

Retention is the ability to keep and recall what has been learned over time; it is a critical component of academic success, particularly in subjects like chemistry that build on previously acquired knowledge. Retention can be defined as the cognitive process through which learned material is encoded, stored, and retrieved for future use, especially when applied to similar or new contexts (Cleopas & Igbojinwaekwu, 2025) Poor retention undermines cumulative learning and affects students' confidence and performance in complex topics. Interactive learning environments have been shown to improve retention by increasing motivation, attention, and

cognitive processing (Amadi, 2022). Interactive periodic tables support this by allowing students to revisit concepts repeatedly, interact with content in meaningful ways, and engage multiple senses in the learning process (Alao, 2021). Ultimately, retention plays a direct role in determining a learner's overall academic achievement in chemistry.

Academic achievement in chemistry depends largely on conceptual understanding and the ability to apply knowledge in both familiar and novel contexts. Academic achievement refers to the measurable performance outcomes of learners in assessments, tests, or examinations that reflect the extent to which educational objectives have been attained (Yusuf & Afolabi, 2020). Academic achievement is the extent to which a student has attained intended learning goals and often reflected in their ability to apply acquired knowledge, think critically, and solve problems as evaluated through formal and informal assessments within an academic program (Hornby, 2022; Marzano (2019). Hassan and Ibrahim (2022) revealed that students who understand the logic of periodicity and element behavior perform better in tasks involving prediction, explanation, and problem-solving. Interactive periodic tables, by supporting visualization and active learning, enhance students' ability to grasp difficult concepts and transfer their knowledge to different learning situations. Research by to Hassan and Ibrahim (2022); Olayemi (2020); Yusuf and Afolabi (2020) indicates that technology-assisted instruction leads to significantly better academic outcomes compared to traditional methods, especially in science subjects like chemistry. However, academic achievement is not influenced by learning tools alone; demographic factors such as gender may also play a significant role.

Gender is an important factor influencing academic achievement and retention, particularly in science-related disciplines such as chemistry. Studies such as Okeke; 2019, Okeke (2022); Oluwole and Adeyemi, (2023) have shown mixed results on the role of gender in learning outcomes. Some research suggests that male students may perform better in tasks requiring abstract reasoning and spatial visualization, skills often associated with mastering chemistry concepts. Conversely, other studies indicate that female students tend to excel when instructional approaches are interactive, collaborative, and context-based, as such methods may increase engagement and understanding (UNESCO, 2022 and Ullah et al, 2025). On the other hand, other studies like Olakanmi(2015); Uzezi and Deye (2020) indicated no statistically significant

difference in performance of male and female students taught acid-base reaction using interactive or simulation-based methods. Social expectations, classroom dynamics, and teacher attitudes can further influence these patterns. Considering these factors, it is important to examine whether interactive periodic table software benefits both male and female students equally, ensuring equity in science education outcomes.

Previous studies have shown that Interactive periodic table improve students' understanding of element properties, For instance, a study conducted by Ramadha (2022) ;Mhlongo, and Sedumedi, (2023) found that Interactive periodic table helps students develop conceptual understanding of chemical bonding and reaction. Similarly, Hoffmann. and Hennessy(2018)and Ullah,S. etal.(2025) found that students who used an interactive periodic table performed better academically than those who used traditional printed periodic tables. Moreover, for students' engagement and retention in science, IPTS group showed better retention of chemical concept than those taught with traditional printed materials (Ullah,S.et al.(2025). In the same vien, Adeyemi and Okafor (2024); Talanquer, (2014) reported that interactive visualization tools improved students ability to retain information about periodic trends and element properties. The benefits of IPTS were stable across students' socioeconomic status and academic self-concept (Chevalère et al., 2021)

Literature has shown substantial evidence that IPTS can develop students 'conceptual understanding of chemical bonding and reaction, students' ability to retain also help students to develop higher learning performance in chemistry (Ullah, S. et al., 2025; Johnson (2023); Hoffmann, R. & Hennessy, T., 2018), most of these studies focused primarily on immediate academic performance and understanding of periodic trends. However, there is limited research on the influence of interactive periodic tables on students' long-term retention of chemical concepts, especially in secondary schools within Onitsha North L.G.A. In addition, few studies have examined students' perceptions and usage patterns of interactive periodic tables in everyday learning. This gap indicates a need to investigate both the academic achievement and retention of students using interactive periodic tables, as well as how students engage with these tools in classroom settings. Based on this backdrop, there is need for the present study to investigate the

perceived influence of interactive periodic table software on the retention and academic achievement of students in chemistry in Onitsha North Local Government Area.

**Purpose of the Study**

The purpose of the study investigated the perceived influence of interactive periodic table software on students' retention and academic achievement in learning element properties in chemistry. Specifically, the study seeks to achieve the following objectives:

1. The extent to which the student use interactive periodic table software in learning of element properties in chemistry.
2. Examine the influence of the interactive periodic table software on academic achievement of students in chemistry
3. Examine the perceived influence of interactive periodic table software on students' retention in chemistry.
4. Examine the perceived influence of interactive periodic table software usage on male and female students' retention in chemistry.

**Research Questions**

The study guided by the following research questions.

11. To what extent do the students use the interactive periodic table software in learning of element properties in chemistry
12. What is the mean perceived influence of the interactive periodic table software on the academic achievement of students in element properties?
13. What is the mean rating of students' retention in the use of interactive periodic table software in learning of element properties in chemistry?
14. What is the mean gender difference of students' retention in the use of interactive periodic table software in learning of element properties in chemistry?

**Methods**

The study utilized a descriptive survey research design to determine influence of the interactive periodic table software on students' retention and academic achievement in the

learning of Element properties. The target population for this study comprised 679Senior Secondary School Students 1 (SS1) in 18- private secondary Schools in Onitsha North LGA. (Ministry of education, 2025/2026 academic session). From which sample size of 200students were drawn. Both 96malesand 104 females made up the sample.. Purposive sampling was adopted to make use of private secondary schools in Onitsha LGA. The choice for using the private school was because some schools are equipped with smart board which could be used in teaching and learning. Also student are allowed to come to school with laptops.

The study used a questionnaire which consisted of 32 items in three sections A, B, C and D. Section A sought information concerning students' demography and has 2 items. Section B concerns with information on the extent to which students use the interactive periodic table software in learning has 10 items with 9 positive items and 1 negative items. Section C which sought information concerning students' retention in the use of interactive periodic table software has 10 items with 8positive items and 2 negative items. Section D which sought information concerning students' academic achievement in the use of interactive periodic table chart has 10 positive A 4-point Likert Scale in the order of: Strongly Agree (SA)-4, Agree (A)–3, Disagree(D)-2 and Strongly Disagree (SD)–1,and. A 4-point Likert Scale in the order VHE-4, HE-3,V LE-2and LE-1 were used for the rating. The reliability of the instrument was established using a pilot study which was conducted in Model Secondary School, Ogidi which was not part of the main study. Data collected from pilot study were analyzed using Cronbach Alpha to ascertain the reliability of the instrument. The reliability yielded coefficients of 0.85 for retention in use of interactive periodic table software and 0.90 for academic achievement. Since both coefficients were above 0.5, they were considered reliable for use in the main study. A reliability coefficientof 0.5 and above is considered reliable (Cronbach & Meehi, 2005). The questionnaire was administered to students in the sampled schools. And asked to tick the extent to which they agreed or disagreed with the items. Data collected were analyzed using Mean and standard deviation to answer research questions at a rating scale of 1.00-1.49=SD and VLE, 1.50-2.49=D and LE, 2.50-3.49=A and HE and 3.50-4.00=SA, VHE respectively.. A mean of 1.00 to 2.49 indicates that more respondents' disagreed with the questionnaire items while that of2.50 to 4.00

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indicates that more respondents agreed to the questionnaire items. A.Standard deviation was used to measure response disparity.

**Results**

**Research question 1:** To what extent do students use the interactive periodic table software in learning element properties in Chemistry?

**Table 1: mean and standard deviation on the extent to which the students use interactive periodic table software in learning of chemistry element properties**

| S/N | Item | X | SD | Remarks |
|---|---|---|---|---|
| 1 | I use the interactive periodic table software for private study at home | 3.25 | 0.89 | High Extent |
| 2 | I consult the interactive periodic table when solving chemistry homework | 3.82 | 0.71 | Very High Extent |
| 3 | I do practice with the interactive periodic table when solving chemistry homework | 3.60 | 0.80 | Very High Extent |
| 4 | I use the interactive periodic table to crosscheck what I learn from textbooks | 3.78 | 0.75 | Very High Extent |
| 5 | I rely on the interactive periodic table software more than printed periodic charts | 3.10 | 1.05 | High Extent |
| 6 | I explore the interactive table for fun, even when it is not part of an assignment | 1.40 | 0.90 | V.LowExtent |
| 7 | I find the software useful whenever I encounter difficulty understanding an element property | 3.35 | 0.70 | High Extent |
| 8 | I depend on the interactive periodic table for quick reference during class discussions | 3.50 | 0.85 | Very High Extent |
| 9 | I use the software regularly at least once a week | 3.45 | 0.89 | High Extent |
| 10 | I do not like using the interactive periodic table software to study because of data consumption | 2.40 | 1.10 | Low Extent |
| | **Grand mean** | 2.83 | 0.87 | High Extent |

The result above shows that the extent to which SS1 students use the interactive periodic table software in learning element properties is high with a grand mean of 2.83. This shows that the students use the interactive periodic table software but not very well. Students specifically use it mainlyto have high performance levels, and homework as reflected on item 2&3showing mean of 3.82 and 3.60 respectively which are above the bench point but not for mastering of the concepts..

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**Research Question 2:** What is the mean perceived influence of the interactive periodic table software on the academic achievement of students in learning of element properties?

**Table 4: Mean and Standard Deviation on the Students' Academic Achievement in the Use of Interactive Periodic Table Software for Learning Element Properties**

| s/n | Item | X | SD | Renmarks |
|---|---|---|---|---|
| 21 | Test and exam scores in chemistry have improved since I started using the interactive periodic table software | 3.77 | 0.60 | Agreed |
| 22 | I earn higher grades on my chemistry assignments whenever I use the software | 2.82 | 1.31 | Agreed |
| 23 | The software has enhanced my understanding of chemical elements during exams | 3.05 | 1.05 | Agreed |
| 24 | My overall academic performance in chemistry has improved due to the interactive software | 2.83 | 1.15 | Agreed |
| 25 | The software helps me to solve chemistry problems more accurately | 3.21 | 0.94 | Agreed |
| 26 | I perform better in practical chemistry tasks after using the interactive periodic table | **3.**14 | **0.**35 | **Agreed** |
| 27 | The software has improved my confidence in answering chemistry questions | 3.45 | 0.79 | Agree |
| 28 | My grades in chemistry tests improved after regular use of the software | 3.80 | 0.65 | Strongly Agree |
| 29 | The interactive periodic table helps me understand chemical reactions better | 3.68 | 0.72 | Strongly Agree |
| 30 | I complete chemistry assignments faster and more accurately using the software | 3.40 | 0.82 | Agree |
| | The interactive features helped me understand chemistry concept better | 3.75 | 0.68 | Strongly Agree |
| | Grand mean | 3.69 | 0.85 | Strongly agreed |

Date presented in Table 2 shows that most items recorded mean scores above the bench mean of 2.50, indicating that students generally agreed that IPTS positively influences their academic performance. The Items with higher mean values (3.68, 3.75 and3.80) reflect that students strongly perceived the IPTS as tool that improve their academic achievement. Overall, the grand mean of 3.69 with a standard deviation of 0.85 confirms that IPTS improved students' academic achievement in learning of element properties in chemistry.

**Research Question Three:** What is the mean rating of students 'retention in the useof interactive periodic table software for learning of element properties in private secondary schools?

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**Table 2: Mean and Standard Deviation on the Mean Rating of Students 'Retention in the Use of Interactive Periodic Table Software for Learning Element Properties.**

| s/n | Item | X | SD | Remarks |
|---|---|---|---|---|
| 11 | I can easily recall element properties after using the interactive periodic table software | 3.80 | 0.51 | Strongly Agreed |
| 12 | The use of interactive periodic table do not improves my long-term memory of periodic table | 3.10 | 0.97 | Agreed |
| 13 | I do not retain information better when I use the interactive periodic table compared to textbooks | 2.35 | 0.66 | Disagreed |
| 14 | Interactive software makes it easier for me to remember the arrangement of elements | 3.25 | 0.79 | Agreed |
| 15 | My ability to answer exam questions improves after using the interactive periodic table | 3.32 | 0.77 | Agreed |
| 16 | I am able to explain element groups and periods better after using the interactive table | 3.15 | 0.88 | Agreed |
| 17 | The interactive periodic table helps me recall valency and atomic numbers | 3.55 | 0.67 | Strongly Agreed |
| 18 | I believe that the interactive periodic table strengthens my overall retention of chemistry | 3.12 | 0.94 | Agreed |
| 19 | Using the interactive periodic table do not reduces how often I forget chemistry information | 2.38 | 1.06 | Disagreed |
| 20 | I find it easier to recall elements and their symbols when used interactive periodic table | 3.23 | .0.48 | Agreed |
| | Grand mean | 3.18 | 0.77 | |

Result on Table 2 shows that all items recorded mean scores above the criterion mean of 2.50, expect item 13 with mean 2.35. This indicated general agreement among students that the interactive periodic table positively influences their retention in learning of element properties in chemistry.. The mean scores ranged from 2.35 to 3.80, while the standard deviations varied between 0.66 and 1.07, suggesting a high level of dispersion and fairly consistent opinions among the students. Overall, the grand mean of 3.18 (SD = 0.77) confirms that students generally perceived the interactive periodic table as an effective tool that enhances their retention ability in chemistry since it is greater than decision point 2.50

**Research Question four:** What is the mean gender difference of students' retention in the use of interactive periodic table software in learning of element properties in chemistry?

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**Table 2: Respondents Mean Rating on the Perceived Influence of IPTS on Male and Female Students' Retention**

| S/N | Items | Male N = 96 | | | Female N = 104 | | |
|---|---|---|---|---|---|---|---|
| | | N = 96 Mean | Std. Dev. | Decision | Mean | Std. Dev. | Decision |
| 11 | I can easily recall element properties after using the interactive periodic table software | 2.90z46 | 1.14 | Agreed | 2.90 | 0.57 | Agreed |
| 12 | The use of interactive periodic table do not improves my long-term memory of periodic table | 3.2038 | 0.85 | Agreed | 3.20 | 0.82 | Agreed |
| 13 | I do not retain information better when I use the interactive periodic table compared to textbooks | 2.14 | 0.94 | Disagreed | 2.10 | 0.79 | Disagreed |
| 14 | Interactive software makes it easier for me to remember the arrangement of elements | 3.32 | 0.86 | Agreed | 3.29 | 0.81 | Agree d |
| 15 | My ability to answer exam questions improves after using the interactive periodic table | 3.31 | 0.82 | Agreed | 3.33 | 0.87 | Agreed |
| 16 | I am able to explain element groups and periods better after using the interactive table | 3.10 | 0.71 | Agreed | 3.18 | 0.91 | Agreed |
| 17 | The interactive periodic table helps | 2.88 | 0.70 | Agreed | 2..60 | 0.96 | Agreed |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | me recall valency and atomic numbers | | | | | | |
| 18 | I believe that the interactive periodic table strengthens my overall retention of chemistry | 2.91 | 1.29 | Agreed | 2.72 | 1.13 | Agreed |
| 19 | Using the interactive periodic table do not reduces how often I forget chemistry information | 2.30 | 0,88 | Disagreed | 2.37 | 0.82 | Disagreed |
| 20 | I find it easier to recall elements and their symbols using interactive periodic table | 3.32 | 0.92 | Agreed | 3.25 | 0.86 | Agreed |
| | **Grand Mean** | **2.96** | **0.91** | **Agreed** | **2.94** | **0.85** | **Agreed** |

Table 2 presents student's responses on the influence of IPTS on male and female students' retention in learning of Element properties. The results shows that most items recorded mean scores above the bench mean of 2.50 indicating that both male and female students generally agreed that the IPTS positively influences their ability to retain the learned concepts.Overall, the grand mean of 2.96 and standard deviation of 0.91 for male and grand mean of 2.94 and standard deviation of 0.85for female indicate strong agreement between genders that IPTShave a positive influence regardless of gender. But male students were slightly influenced more than female.

**Discussions**

The study's findings are categorized into three: the extent to which students make use of the interactive periodic table in learning chemistry, the influence IPTS on students' academic achievements and the influence of IPTS on students' retention chemistry and gender

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**The extent to which students make use of the interactive periodic table in learning chemistry**

The results of the study indicated the extent to which students make use of the interactive periodic table in learning chemistry. The analysis showed that many of the questionnaire items were rated High Extent (HE), suggesting that students regularly use the interactive periodic table to study chemical elements and their properties mostly when doing homework and learning. This means that the tool supports students in understanding information about elements such as Nitrogen, and Carbon. Furthermore, some of the items had Very High Extent (VHE) ratings. This implies that students strongly rely on the interactive periodic table to explore periodic trends, obtain quick information about elements, and enhance their understanding of chemistry concepts. The interactive features appear to make learning more interesting and help students grasp difficult topics more easily. However, a few items were rated Low Extent (LE). This suggests that not all students frequently use the interactive periodic table in their learning activities. Possible reasons for this could be limited access to digital devices, inadequate internet connectivity, or insufficient awareness of the tool. Generally, the findings revealed that students utilize the interactive periodic table to a high extent in learning chemistry, indicating that it is a valuable resource for improving students' understanding of periodic table concepts. The finding supports the report of Adeyemo and Adedoja (2022) who reported that interactive periodic table software is particularly useful in academic-related tasks as it provides opportunities for learners to apply chemical knowledge.

**Interactive Periodic Table on Academic Achievement**

The study found that students strongly perceived the Interactive periodic table software as tool that improves their academic achievement. That IPTS positively influenced their academic achievement in learning element properties. This finding tallies with that of Ullah, S. et al. (2025), who reported that students using a virtual interactive periodic table demonstrated significantly higher learning performance. The finding also agrees with Hoffmann and Hennessy, (2018) who found that interactive periodic table activities enhanced students' understanding of periodic trends. The improvement in academic achievement may be attributed to the visual and

interactive nature of the tool, which allows students to explore elements, their properties, and trends actively rather than passively reading from textbooks. Interactive features, such as clickable elements and animations, likely reinforced learning and made abstract concepts more tangible, leading to better performance.

**Interactive Periodic Table Software on Retention**

The findings indicate that the interactive periodic table positively influences students' retention in learning of element properties. Meaning that students retained knowledge longer when they used ITPS during learning. This aligns with the work of Talanquer (2014), who reported that interactive visualization tools enhance long-term retention of chemical concepts. The improved retention can be attributed to the repeated engagement with interactive elements, which strengthens memory encoding and retrieval. Students were able to revisit and explore periodic trends multiple times, leading to better internalization of concepts.

Gender analysis showed that interactive Periodic Table influenced both male and female students' retention in learning of element properties in chemistry. The findings supports Musa and Ali (2023), who reported that interactive technologies provide equal learning opportunities, thereby reducing the gender gap in science learning. The outcome could attributed to the repeated engagement and interactivity likely helped reinforce memory for all students. The result also agrees with Talanquer (2014); Olakanmi (2015); Uzezi and Deya (2020), who reported no statistically significant difference in retention of male and female students in Chemistry. And this supported the popular saying "what I see. I remember". However, the finding showed that male students were slightly influenced than female students, although both genders showed the closed level of agreement. The findings is in line with Chukwu and Onah (2022), who found that female students often perceive more barriers in technology use, but these barriers can also push them to develop resilience and adaptive strategies.

**Conclusion**

The study revealed that students in Onitsha North LGA used the interactive periodic table software to a high extent, mainly for academic tasks. The software was found to have positive

influence on both retention and academic achievement. The findings further revealed a slight gender difference.

**Recommendation**

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

Teachers should consider using interactive periodic tables as supplementary tools alongside traditional teaching methods, especially when teaching abstract concepts such as periodic trends and element properties.

The researcher suggested that integrating interactive learning tools into chemistry education can improve academic achievement. Enhance long-term retention of concepts.

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