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# Preference and Satisfaction Regarding Learning Methods Among Medical Students of The University of Port Harcourt, Nigeria

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Article history: Received 03 February 2025, Reviewed 26 June 2025, Accepted for publication 20 July 2025

## Abstract

**Background:** To find the most efficient approach to learning, this study assessed preference, satisfaction and factors associated with learning methods among medical students at the University of Port Harcourt.

**Materials and methods:** A cross-sectional study design with a multi-stage sampling method was employed in collecting data from 363 registered 400-600-level medical students at the university. Data collected were analysed using IBM Statistical Package for the Social Sciences (SPSS) version 25.0.

**Results:** A total of 363 respondents with a mean age of 23.8±2.9 years were interviewed. 161(44.4%) of them preferred in-person learning, 36(9.9%) preferred virtual learning, and 166(45.7%) preferred the hybrid method. With the in-person learning, 173(47.7%) were satisfied and 92(25.3%) very satisfied. 150(41.3%) were satisfied with virtual learning and 22(6.1%) were very satisfied. 177(48.8%) were satisfied with hybrid learning, 95(26.2%) were very satisfied. Some factors influenced preference for method of learning, interaction with teachers and colleagues being the most considered (32%). Statistically significant relationships were observed between 'sex' (P=0.009), 'level of study' (P=0.001), 'access to the device for virtual learning' (P=0.040), 'levels of satisfaction from methods of learning' (p-values<0.001) and preferred method of learning. There was no statistically significant relationship between 'age', 'marital status', 'religion' and preferred methods of learning (p-values >0.05).

**Conclusion:** The method employed in learning is important to achieve effectiveness. The virtual learning method was the least preferred, while the hybrid method was the most preferred. The provision of necessary equipment and network facilities would improve virtual learning, and these are recommended.

**Keywords:** In-Person, Virtual, Hybrid, Learning, Medical Students.

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**How to cite this article**

*Elema GC, Emejuru D, Emma-Okpuruka DC, Ogbonna VI.* Preference and Satisfaction Regarding Learning Methods Among Medical Students of The University of Port Harcourt, Nigeria. The Nigerian Health Journal 2025; 25(3): 934 – 942. https://doi.org/10.71637/tnhj.v25i3.1027

## INTRODUCTION

There are several definitions of learning from various authors, and the majority of them centred their ideas around a certain feature, which is " the product, result or outcome".[1] For instance, "learning is frequently described as a somewhat permanent change in behaviour, knowledge, and cognitive abilities as a result of experience", as seen in several textbooks on educational psychology[1]. Nonetheless, in 1979, the University of Gothenburg in Sweden's Prof. Roger Saljo, an education and educational psychology expert, discovered that students' conceptualisation of learning fell into five (5) categories.[1]: learning is "knowing a lot" and gaining information- a quantitative growth in knowledge[1]; as memorisation- the act of retaining and reproducing information[1]; as the process of gaining knowledge, abilities, and strategies that one can apply later on when needed[1]; as abstracting meaning or making sense of it, which entails connecting various aspects of the subject matter to the outside world[1]; and as perceiving and comprehending reality differently: which entails reinterpreting knowledge in order to comprehend the world[1]

The approach put forth by Prof. Saljo is significant since it describes learning as a "process" as well as a "product."[1] Learning is a process that modifies people's perceptions, experiences, and understanding of the world[1].
Learning can [2] be done virtually or in person. Learning that happens in-person, commonly referred to as physical or in-person learning, means that instruction and learning are taking place at the same location and time [3]. On the other hand, education that takes place virtually is referred to as virtual learning, virtual learning, remote learning, e-learning, or distance learning.[3]

Virtual learning can be asynchronous or synchronous [3]. Synchronous learning pertains to any form of education that takes place simultaneously, albeit not at the same location.[3] Learning is deemed synchronous, for instance, when a course is delivered by virtual video streaming from an instructor in one place to the students, who are all signing in to learn from a different location (for example, their homes) [3]. Asynchronous learning occurs when instruction and learning take place at various times and in different places[3]. This might occur when students log in to watch a lecture that their teacher recorded later.[3]

There is also hybrid or blended learning, which involves both in-person and virtual learning.[2]
Universities are providing more "flexible" learning settings due to rapidly evolving technologies and shifting student lifestyles. [4]

For more than ten years, the higher education industry has seen a rapid development in the availability of virtual/virtual learning experiences, in line with the opportunities that technological advancements allow [4-6].
A sizable percentage of university students worldwide now participate in virtual learning as part of their educational experience [4,7,8]
Students in different classes have had somewhat varying experiences with both in-person and virtual learning; although some have met expectations, others have not.[4].

Globally, there has been an increasing preference for virtual learning and even a transition to its use, especially in some higher institution.[9,10] In Africa, Nigeria, for instance, it has been noticed that in-person learning is still preferred over the years.[11] Due to the challenges of availability of facilities, socioeconomic status of students, cultural factors, and ineffectiveness, fraught with the introduction of virtual learning[12] especially at the peak of the COVID–19 pandemic. And this has influenced the methods used currently in the post–COVID era.[11]

There have been variations, however, in the levels of satisfaction with these methods globally, as some studies reveal moderate or high satisfaction with virtual learning, and others have better satisfaction with the hybrid method[13–15]. In Africa, less preference for virtual learning would point to less satisfaction with the method and more preference for in-person learning, as some schools are yet to adapt to forms of learning other than the in-person teaching method.[16,17]

The medical students from previous studies, both globally and within the country, have shown to be interested in the incorporation of other forms of learning, but due to the need to have a physical interaction in clinical sessions, some have shown a preference for in-person learning.[18-20]
At one point or another, the 400-level to 600-level students at the University of Port Harcourt have used both modes of learning. This study aims to assess their


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preferred mode of learning, their satisfaction with it, and the factors associated with it.

## METHODS

**Study Design:** A cross-sectional study design was employed for this study.

**Study Settings:** The study was carried out among medical students at the University of Port Harcourt, a tertiary institution located in the areas of Aluu and Choba within the city of Port Harcourt, Rivers State. It is positioned within the South-South (Niger Delta) region of Nigeria [21]. It is situated on latitude 4°53'14"N - 4°54'42"N and longitude 6°54'00"E – 6°55'50"E[22]. The university is a diverse environment comprising students from various local and global backgrounds, representing different cultural groups. Although many languages are spoken, the main ones are English and Pidgin. The university community comprises primarily students, along with academic and non-academic staff, petty traders, and proprietors of small and medium-sized businesses operating within the campus vicinity. The university comprises fourteen (14) undergraduate faculties and a School of Graduate Studies [22].

**Study Participants:** The population for this study included undergraduate medical students at the University of Port Harcourt from the 400-600 level.

**Sample Size**: The minimum sample size was determined using Cochran's formula [23]:

$$n = (z^2\,pq)/e^2$$

Where n is the sample size in terms of number of students, e is the error tolerance (level) or margin of error set at 0.05, and a prevalence rate (p) was estimated as 0.422 from a previous study that was carried out among undergraduate medical students and paediatric residents in Port Harcourt, Rivers State[24], q = (1-p), z is the z-score value found on the z-score table (1.96). The calculated sample size was adjusted for non-response, assuming a non-response rate of 10%. Sample reduction was also applied due to a small population using the formula, $N_f = n / (1+n/N)$, where Nf is the reduced sample size; n is the sample size, and N is the population size. Design effect was also applied as the sample size was multiplied by 1.5. Hence, the minimum sample size for this study was estimated to be 342 students.

**Sampling Technique:** A multi-stage sampling technique was employed for this study.

**The first stage** was estimating the minimum number of participants from each level for the study. The clinical students included the 400L, 500BL, 500AL and 600L students. The total number of students in each level was 151, 127,145 and 82, respectively, giving a sum of 505 clinical students. The stratified sampling method was employed with proportionate allocations across levels to estimate the minimum number of participants from each level using the formula: $nh = (Nh/N) \times n$ [25] where nh is sample size using proportionate stratified random sampling**,** Nh is total stratum population**,** N is total population and n is sample size. Hence, the minimum number of students from each class was 102, 86, 98 and 56 for levels 400, 500B, 500A and 600 students, respectively.

**The second stage** was the selection of study participants using a simple random (computer-generated table of random numbers) sampling method.

**Study Instrument:** A semi-structured self-administered questionnaire was used for this study. The questionnaires had four (4) sections, which are the sociodemographic, learning methods preference, satisfaction, and factors associated sections. Learning methods was measured on a nominal scale while satisfaction was measured on a 5-point Likert scale (very dissatisfied, dissatisfied, neutral, satisfied, very satisfied). Content validity of the questionnaire was ensured by the content expert (the project supervisor). The questionnaire was then pretested in another department before it was deployed for the survey.

**Data Analysis:** Data collected was uploaded into a Microsoft Excel spreadsheet and analysed using a computer software – IBM Statistical Package for the Social Sciences (SPSS), now Statistical Products for Service Solutions version 25.0. Data from the study was reported using a chart and tables. Descriptive statistics was used to summarise learning method preferences and satisfaction with learning methods while inferential statistics (Chi-square test) was used to test the association between the outcome variable (preferred learning methods) and the independent variables (sociodemographic variables).

**Study Duration:** This study was carried out from January 2024 to July 2024.

Ethical approval was sought and obtained from the research and ethics committee of the University of Port Harcourt Teaching Hospital (Approval number: UPTH/ADM/90/S.11/VOL.XI/1725).


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## RESULTS

### Response rate/Data completeness

Three hundred and sixty-three (363) questionnaires in all were filled out and all the data were deemed suitable for analysis after being cleaned, resulting in a 100% data completeness rate.

**Table 1:** Socio-demographic Characteristics

| Variable | Freq (n=363) | Percent (%) |
|---|---|---|
| **Sex** | | |
| Male | 168 | 46.3 |
| Female | 195 | 53.7 |
| **Age group** | | |
| <20 | 9 | 2.5 |
| 20-29 | 342 | 94.2 |
| 30-39 | 11 | 3.0 |
| 40-49 | 1 | 0.3 |
| Mean ±SD | 23.8±2.9 | |
| **Religion** | | |
| Christian | 352 | 97.0 |
| Islam | 3 | 0.8 |
| Others | 8 | 2.2 |
| **Marital status** | | |
| Single | 350 | 96.4 |
| Married | 7 | 1.9 |
| Cohabiting | 4 | 1.1 |
| Divorced | 2 | 0.6 |
| **Level of study** | | |
| 400 | 103 | 28.4 |
| 500 | 185 | 51.0 |
| 600 | 75 | 20.7 |

The result in Table 1 shows that 195 (53.7%) of the respondents were females, 342(94.2%) were between the age of 20-29 years with a mean age of 23.8±2.9, 352(97.0%) were Christians and 350(96.4%) were singles. Also, 103(28.4%) were in 400 level, 185(51.0%) were in 500 level and 75(20.7%) were in 600 level. (Table 4.1)

**Table 2:** Preference Regarding Learning Methods

| Variable | Freq (n=363 | Percent (%) |
|---|---|---|
| **Participated in virtual class** | | |
| Yes | 355 | 97.8 |
| No | 8 | 2.2 |
| **What platform n=363** | | |
| Google Classroom | 305 | 85.9 |
| Zoom | 294 | 82.8 |
| WhatsApp | 130 | 36.6 |
| Skype | 15 | 4.2 |
| Microsoft teams | 12 | 3.4 |
| **Preferred mode of learning** | | |
| In-person learning | 161 | 44.4 |
| Virtual learning | 36 | 9.9 |
| Hybrid | 166 | 45.7 |
| **Reasons for preferred learning mode** | | |
| More time with colleagues and teachers | 218 | 60.1 |
| Convenience | 193 | 53.2 |
| Timesaving | 129 | 35.5 |
| It is cheap | 102 | 28.1 |

Table 2 shows that 355(97.8%) of the respondents had participated in virtual class, 305(85.9%) participated in Google Classroom, 294(82.8%) participated in Zoom meetings and 130(36.6%) participated in WhatsApp virtual learning. Furthermore, 161(44.4%) of the respondents preferred in-person learning, and 166 (45.7%) preferred a hybrid form of learning. The common reasons for preferred mode of learning were more time being spent with colleagues and teachers 218(60.1%), convenience 193(53.2%) and timesaving 129(35.5%).

**Table 3:** Satisfaction Regarding Learning Methods

| Variable | Frequency n=363 | Percentage (%) |
|---|---|---|
| **Satisfaction with in-person learning** | | |
| Very satisfied | 92 | 25.3 |
| Satisfied | 173 | 47.7 |
| Neutral | 74 | 20.4 |
| Dissatisfied | 14 | 3.9 |
| Very dissatisfied | 10 | 2.8 |
| **Satisfaction with virtual/online learning** | | |
| Very satisfied | 22 | 6.1 |
| Satisfied | 150 | 41.3 |
| Neutral | 145 | 39.9 |
| Dissatisfied | 35 | 9.6 |
| Very dissatisfied | 11 | 3.0 |
| **Satisfaction with Hybrid Learning** | 95 | 26.2 |
| Very satisfied | 177 | 48.8 |
| Satisfied | 73 | 20.1 |
| Neutral | 10 | 2.7 |
| Dissatisfied | 8 | 2.2 |
| Very dissatisfied | | |


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Table 3 shows that 173(47.7%) were satisfied with in-person learning, 92(25.3%) were very satisfied with in-person learning and 74(20.4%) were neutral concerning in-person learning. Also, 150(41.3%) were satisfied with virtual learning, 22(6.1%) were very satisfied and 145(39.9%) were neutral. 177(48.8%) were satisfied in person learning, 95(26.2%) were very satisfied with hybrid learning.

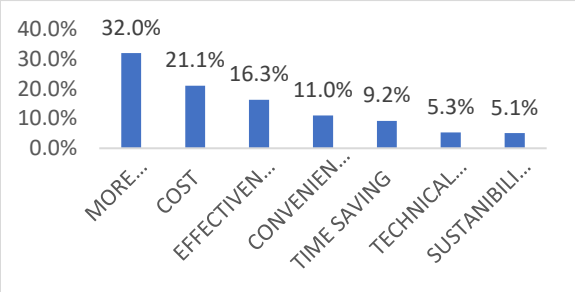


**Figure 1:** Reasons for preferred choice of learning method

The result shows that 32.0% of the respondent's preferred choice of learning was influenced by the interaction time with colleagues and teachers.

**Table 4:** Factors Associated with Preferred Learning Method

| Variable | Preferred Learning Method | | | $X^2$(P-value) |
|---|---|---|---|---|
| | In Person n (%) | Virtual n (%) | Hybrid n (%) | |
| **Age group** | | | | |
| <30 years | 157(44.7) | 35(10.0) | 159(45.3) | 0.802(0.670) |
| ≥30 7ears | 4(33.3) | 1(8.3) | 7(58.3) | |
| **Sex** | | | | |
| Male | 62(36.9) | 23(13.7) | 83(49.4) | 9.324(0.009) * |
| Female | 99(50.8) | 13(6.7) | 83(42.6) | |
| **Marital Status** | | | | |
| Single | 159(44.7) | 36(10.1) | 161(45.2) | 2.139(0.343) |
| Married | 2(28.6) | 0(0.0) | 5(71.4) | |
| **Level of study** | | | | |
| 400 | 43(41.7) | 21(20.4) | 39(37.9) | 21.130(<0.001) * |
| 500 | 78(42.2) | 13(7.0) | 94(50.8) | |
| 600 | 40(53.3) | 2(2.7) | 33(44.0) | |
| **Religion** | | | | |
| Christian | 156(44.3) | 34(9.7) | 162(46.0) | 1.002(0.606) |
| Others | 5(45.5) | 2(18.2) | 4(36.4) | |
| **Have access to the device for virtual learning** | | | | |
| Yes | 143(44.1) | 28(8.6) | 153(47.2) | 6.447(0.040)* |
| No | 18(46.2) | 8(20.5) | 13(33.3) | |
| **Satisfaction with in-person learning** | | | | |
| Very dissatisfied | 8(80.0) | 1(10.0) | 1(10.0) | 55.203(<0.001)* |
| Dissatisfied | 2(114.3) | 7(50.0) | 3(35.7) | |
| Neutral | 19(25.7) | 11(14.9) | 44(59.5) | |
| Satisfied | 76(43.9) | 11(6.4) | 86(49.7) | |
| Very satisfied | 56(60.9) | 6(6.5) | 30(32.6) | |
| Satisfaction with Virtual Learning | | | | |
| Very dissatisfied | 9(81.8) | 2(18.2) | 0(0.0) | 96.869(<0.001) * |
| Dissatisfied | 27(77.1) | 4(11.4) | 4(11.4) | |
| Neutral | 79(54.5) | 10(6.9) | 56(38.6) | |
| Satisfied | 45(30.0) | 9(6.0) | 96(64.0) | |
| Very satisfied | 1(4.5) | 11(50.0) | 10(45.5) | |

*Statistical Significance


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The result shows that sex ($X^2$=9.324, P=0.009), Level of study ($X^2$=21.130, P=<0.001) and access to device for virtual learning ($X^2$=6.447, P=0.040), level of satisfaction with in-person learning ($X^2$=55.203, P<0.001), level of satisfaction with virtual learning ($X^2$=98.869, P<0.001) were significantly associated with preferred choice of learning.

## DISCUSSION

This study examined the preference and satisfaction regarding in-person and virtual learning among medical students at the University of Port Harcourt. It was observed that nearly half of the respondents (45.7%) preferred the hybrid method, closely followed by in-person learning (44.4%); 97.8% of respondents who have had an experience of virtual learning. The findings align with studies carried out in Nigerian medical schools that showed the incorporation of the virtual method in learning[26,27]. Although the studies did not reveal a preference for the hybrid method.

However, the studies in Nigerian medical schools revealed a preference for in-person learning [24,28]. With one carried out at the University of Port Harcourt, having 57.8% of respondents preferring in-person learning [24]. In contrast, a study in Babcock University Medical School had 66% of respondents preferring virtual learning.

Studies in India showed that most of the students preferred the hybrid method (72.5%)[29,30]; a study in China showed that most preferred in-person learning (55%)[31] while another study in the United Kingdom showed the students preferred virtual learning (66.12%) [32] The reason for more time for interaction with teachers and colleagues (60.1%) is similar to previous studies.[28,30]

Hence, it can be inferred that the preferred method of learning among medical students varies in schools and different geographical locations. This therefore implies that methods applied in schools should not be adopted from what is obtainable in other schools, but rather from what enhances learning in each specialty or location.

Most of the respondents were satisfied with the in-person, virtual and hybrid method of learning (47.7%, 41.3% and 48.8% respectively), with more students satisfied with the hybrid method. When compared to previous studies in Nigeria, it is quite significant as there have been challenges in creating an effective virtual learning [33] and also the need to improve on the in-person learning method.[34]

However, a significant number of the students (47.7%) think that in-person learning is very effective in medical education.

The study in a medical school in Enugu [35] showed a higher use of (97.8%) and satisfaction for (99%) virtual learning tools. Though with similar challenges as seen in this study, the students suggested that virtual learning and in-person learning can both be used. This was due to the advantages of access to virtual tools, which were helpful to the students and the flexibility it provided.

In contrast to studies in Morocco, Russia and Iran, the medical students were more satisfied with virtual learning (66.8%, 79%, 74% respectively)[36–39], while a study in New York showed that medical students were more satisfied with in-person learning, with the view that clinical and practical sessions were better learnt physically.[13]

In the study carried out in Iran, the basis of the students' satisfaction with virtual learning was due to a good academic performance, even though they were dissatisfied with the cost incurred in taking virtual classes.[36]

This implies that the level of satisfaction with the methods of learning is influenced by factors (benefits and drawbacks) associated with employing the methods and consequently the effect it has on the quality of education the students receive. The benefits of the preferred methods should be weighed as compared to the challenges and how best the methods can be applied.

The proportion of respondents whose preferred learning method was influenced by the level of interaction with teachers and colleagues was 32%. This had the highest report among other factors, which points to the importance of effective communication in learning. This is in tandem with studies carried out in medical schools in Nigeria, as poor internet connectivity was a key drawback in virtual learning[24]. Less interaction with patients was also a drawback from a study carried out in Poland, as a high proportion (70%) of the students reported this[40]; as well as from a similar study done in the United Kingdom (82.17%).[32]

For 21.1% of the respondents, cost influenced their preferred method of learning. This is similar to previous studies carried out in some medical schools in Nigeria[12,24] which points out that the cost of having virtual learning determines its sustainability[12,24]. Cost of implementation of virtual learning is a major challenge


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among users, hence, should be considered when making the choice of virtual learning.

However, a study carried out in the United Kingdom revealed that some students (14.24%) find virtual learning more cost-effective such as it saves them the cost of transportation to school [32]. This would be for the students who live far from school.

16.3% of respondents had their choice influenced by the effectiveness of the lectures they had used each of the methods, with in-person learning being more effective than virtual learning, but the students preferred the hybrid of the two (57.6%). The other factors all contribute to the effectiveness of learning.

A proportion of the students from a study in the United Kingdom had their choice influenced by flexibility and convenience (64% and 54% respectively)[40] which was higher than that observed in this study, 11%. This could be due to the peculiarities of the medical school curriculum, of required physical presence for clinical postings. Flexibility and convenience is an important factor in learning, therefore, the comfort and convenience of the learners are paramount for learning to take place.

The technical ability is also another factor (5.3%), which was similar to one carried out among medical students of the University of Port Harcourt[24]. But less of this is observed in studies done in other countries.

It was also observed that sex, level of study, access to device for virtual learning and level of satisfaction with the methods of learning had a statistically significant relationship with the preferred choice of learning; the second and third are in keeping with similar studies.[12,32,40] The relationship of sex may not be understood or determined but level of study could be related to methods of learning because higher levels will require more advanced way of learning which may require the use of various forms of learning. All devices that could access the internet can be used for learning; there's no special requirement for internet access. Level of satisfaction is dependent on the availability of access to the methods especially when it affects internet connections, weather conditions and network providers' issues.

This implies that the factors associated with the preferred methods of learning also cut across individual or personal factors, the nature of the curriculum and availability of technology, and not merely preferences based on personal interest.

**Limitations of the study and areas for future research**

The study is a cross-sectional study/snapshot, it may not reflect changes over time or variations in health behaviours or outcomes; however, efforts were made to ensure accurate data were collected. We used pre-tested and validated instruments to ensure data consistency, and a structured sampling method was used to enhance representativeness. Future researchers can use a mixed methods approach that will combine qualitative insights and quantitative data to provide a deeper understanding of the preference and satisfaction in learning methods

**Implications of the findings of the study**

The findings of this study reveal the interest of medical students in employing both in-person and virtual learning. School authorities can help make free network connections available and accessible in designated areas within the school premises to facilitate hybrid learning. Lecturers can incorporate virtual learning for lectures that require a variety of resources for better understanding. Students should maximise the use of both learning methods (the hybrid method) and give feedback regularly on what should be improved.

## CONCLUSION

The virtual learning method was the least preferred, 36 (9.9%), followed by in-person learning, 161 (44.4%), while the hybrid method was the most preferred, 166 (45.7%). This showed that although many students preferred in-person learning, more would prefer both methods to be used in the system. Improving the quality of medical education is vital to having well-trained medical students and doctors. Factors like interaction with teachers and colleagues are the most considered to influence preference for the methods of learning. These findings are significant and should guide the planning and structuring of the medical school curriculum for effective learning. Learning methods are to enhance the students' capacity and improve their outcome whether in the classroom or clinical area. It is imperative for school management to ensure the best method of learning is implemented for best outcomes.

**Conflict of Interest Declaration:** None declared

**Acknowledgement:** Our sincere gratitude goes to the 400-600 level medical students at the University of Port Harcourt who participated in the study. The authors did not receive any funding.


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**Ethical conformity statement:** The ethical committee of the University of Port Harcourt Teaching Hospital approved the data collection (Approval number: UPTH/ADM/90/S.11/VOL.XI/1725). Each respondent provided informed consent.

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