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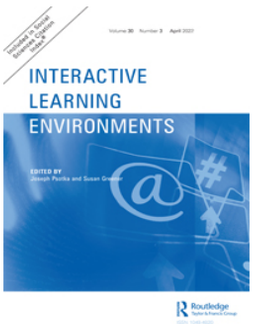

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Virtual-assessment performance hampered by slow adaptation to tech environment

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ABSTRACT

The current investigation reflects on the insufficient performance of students in virtual exams in the era of transformation of the physical mode of education to digital one due to the passive adaptation to the technical drive of the virtual environment, the tenuous command of platform's technical language, especially in mathematics and physics exams, and the anxiety of coping with superfluous difficulties of a non-traditional exam framework. R programming and data visualization approach have been employed to highlight the seriousness of these problems and their role in causing a plausible decline in students' exam outcome. This study also features some crucial developments that could be undertaken to battle these issues and to enhance the virtual exam performance in the future.

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KEYWORDS
Digital assessment; slow adaptation to technical ambience; deficient virtual-exam performance; data visualization

1. Introduction

In the challenging times of COVID-19, the world saw a remarkable transformation in the field of education, just like the changes brought on in each terrain of life to carry it through without much disruption. The necessity of virtual and remote learning programs was realized, adopted and perfected to augment the learning benefits (Barrot et al., 2021; Batdi et al., 2021; Gupta et al., 2021; Kearns, 2012; Martin et al., 2020; Mishra et al., 2020; Rapanta et al., 2020; Ross, 2017; Wright, 2019; Zimmer & Matthews, 2021) and to prevent the waste of foundational years of student life. Numerous learning platforms were introduced to assimilate the mechanism of in-class lectures, discussions and assessments. The automation of the educational realm was nothing less than a miracle. However, the metamorphosis of the mode of education from regular to virtual did not come without some compensation. Some unfavorable aspects of the electronic mode of education included the absence of motivating learning ambience, conditioned interaction between students and teachers, distracting territorial issues and particularly a pressing obligation to adapt to the tech environment. It was certainly a challenge to learn the e-skills to not only sail through the virtual experience but to also gain an in-depth subject understanding concurrently.

A prosperous employment of abrupt and non-traditional educational practice requires the development of an objective framework that distinctly stipulates the evolvement of each of its phases. The constitutional foundation of each phase of such a framework is based on creating a balance between the strengths and limitations of a prospective target. In the case of abrupt deportation from in-class assessment to virtual assessment, a significant objective of habituating the student community with virtual platforms' complexity levels was undervalued. The lack of a proper framework of training and access to uniform-outlook exam platforms caused numerous

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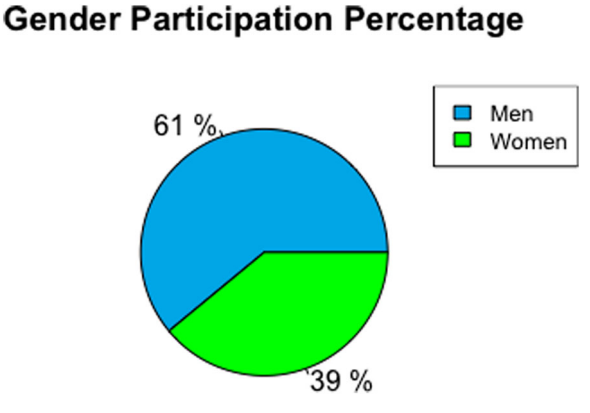
limitations to a substantial number of students in performing well in the virtual environment. The relevance of improving a virtual testing stage for the purpose of optimized assessment is suggested through the prior scholarly endeavor. Sheard et al. (2013) reported that a factual assessment of a student's skill and knowledge in an exam could be gauged through purpose-built classification assessment scheme. They emphasized on attaining the goal of objective assessment through prior training of handling exam questions' complexity levels, linguistic limitations, coding restrictions and external domain obstacles. Additionally, this study suggested that a better assessment-output required a comprehensive platform acquaintance on the part of students. The predominant use of online tests to assess students' foundational knowledge, in addition to appraising their humanistic and meta knowledge, without the creation of compatible platforms can lead to the failure of the digital mode of valuation (Brady, 2005; Scott, 2016; Smith, 2007; Yonker, 2011). A study (Boitshwarelo et al., 2017) on the optimization of online tests in a digital age maintained the necessity of harnessing possibilities afforded by digital platforms to reach meticulous assessment goals. It calls for addressing the multiple challenges of evaluating students' learning and their ease in demonstrating the acquired knowledge.

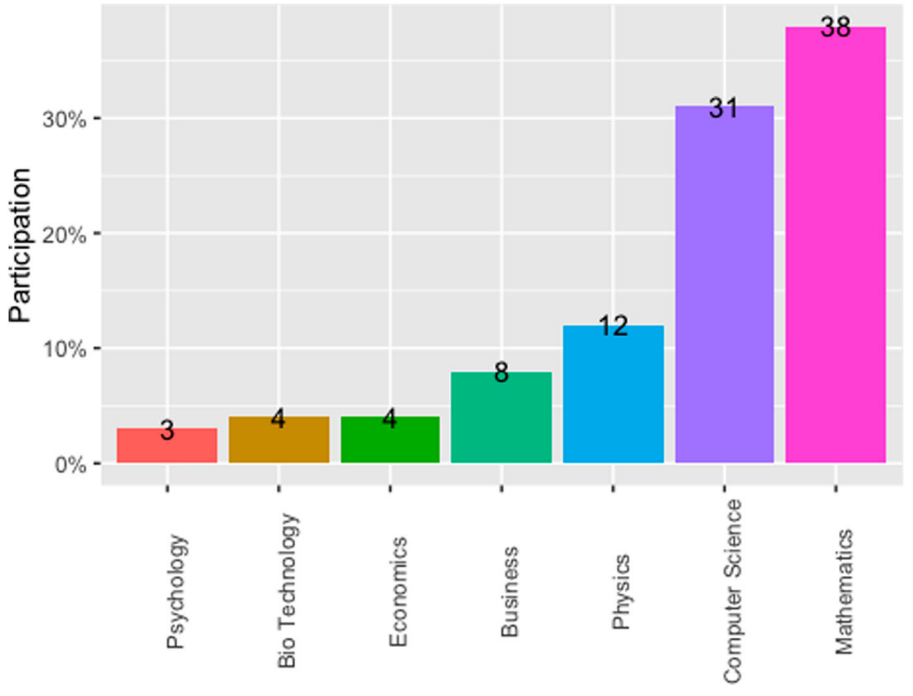
The present study has been conducted to exhibit the inadequacy of students to perform to their ceiling potential in virtual assessments. The issues of slow adaptation to technical skills of a virtual habitat, meager command of technical symbols' use and the anxiety of coping with unchartered digital platform contentions are ascribed to be the principle causes.

2. Data formation

To investigate the hindrances encountered by students while performing in virtual exams, numeric and characteristic responses were collected from freshman and senior bachelor students of sciences and humanities programs in local universities including a liberal arts university. For the purpose of clarity and generalization, both men and women students' participation was highly encouraged, and the following proportion of gender classification was observed.



Due to the contrasting nature of exams required by different subjects in sciences and non-sciences curriculum, specific subject-related technological issues were recorded from the students of digital science, finance, physical science and social science programs. The current picture shows the percentage of participation from these programs.



3. Methodology

R programming (Hehman & Xie, 2021) has been employed to examine the obtained data results and various tactics of data visualization have been adopted to bring out the authentic sentiments of learners pertaining to their performance in virtual assessments. The current data analysis also suggests the inclination of students for the future course of action towards the exam mode. Participants responded to the questions of whether they were able to deliver their maximum understanding of a subject in a virtual exam, did the specific language and technical manipulations of the online exam-habitat hinder their performance, did they spend comparatively more time on understanding the questions and forming their answers in a digital platform, and whether they could've performed better in a traditional class exam. Their quantified responses have been displayed through the bar charts.

4. Discussion

Figure 1 exhibits 52% of the total participants responding to the fact that they were unable to deliver their optimal understanding in a virtual exam due to the reasons of apprehension towards testing in a non-traditional setup, the absence of class environment and guiding supervision and the stress of power or technology breakdown. Incidentally, 2.9% of the candidates expressed their inability to perform well in an online exam due to the mental crunch caused by the running clock on each question.

Figure 2 points to a reasonable percentage of students, 36%, echoing their failure to provide superlative responses due to the complex outlook of virtual exam display, lack of comprehending the tools to draw or design their solutions, non-uniformity of different kinds of digital exam platforms and a slow adaptation to novel technological apparel. 96.7% of these respondents were

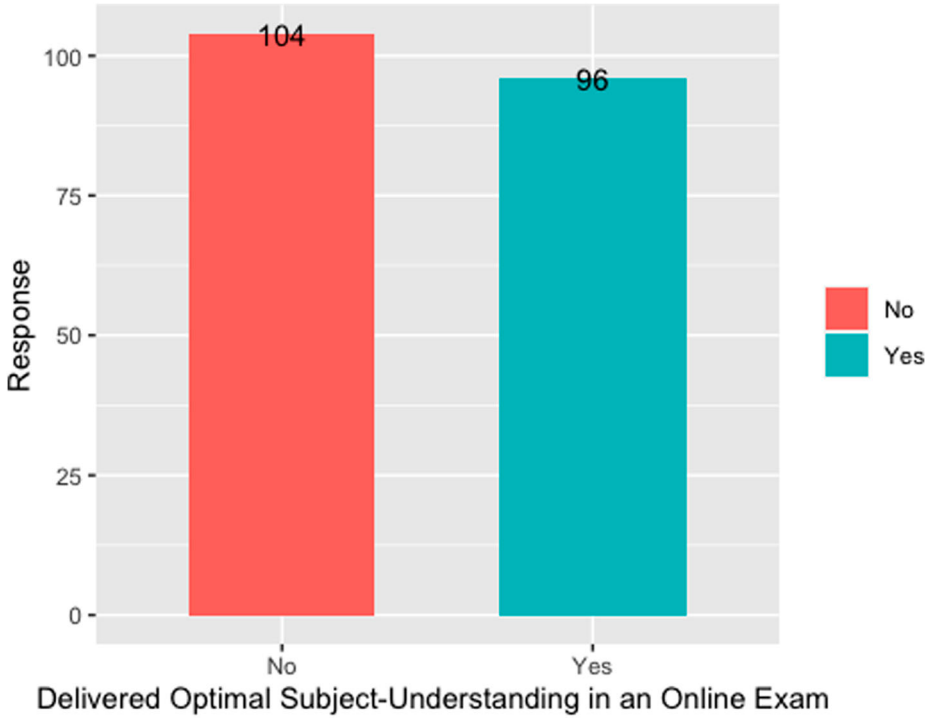


Figure 1. Delivered optimal subject-understanding in an online exam.

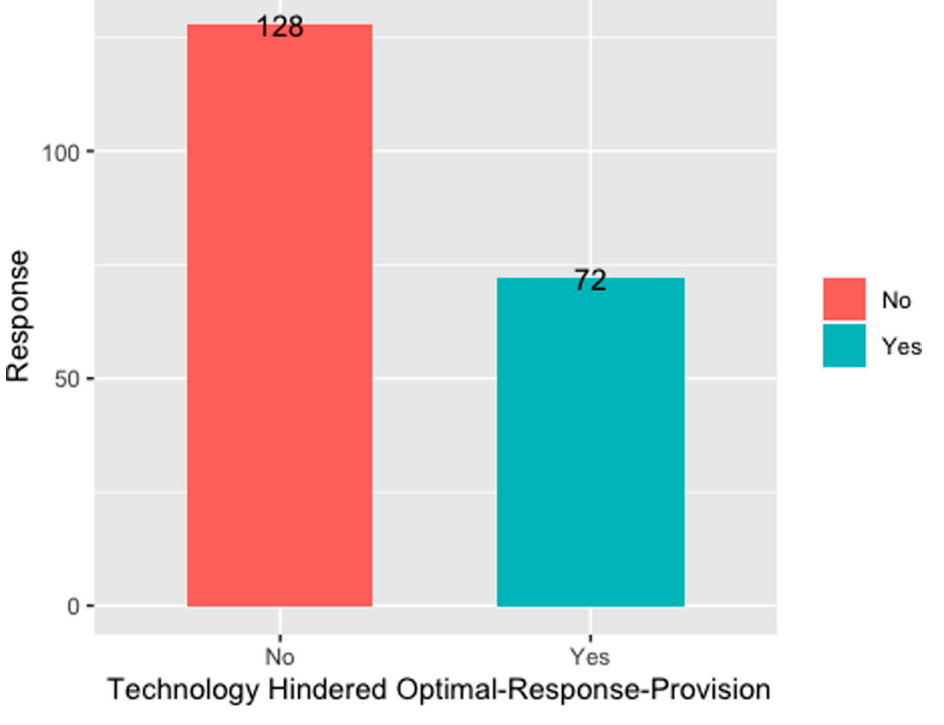


Figure 2. Technology hindered optimal-response-provision.

observed to have taken exams in physical sciences, and specifically felt tech-deficient while performing mathematics or physics tests, requiring them to geometrically relay some of their responses.

Figure 3 speaks of an alarming percentage of students, 40.5%, proclaiming to having spent the significant amount of exam time in trying to understand and handle the technological administration of virtual platforms, affecting the overall time management of their assessment. Among these respondents, 92% of mathematics students felt incapacitated to regulate their responses, especially of the kind involving mathematical jargons and graphs, despite the provided set of instructions on how to handle those questions. They expressed that their below average performance was partly attributed to the anxiety of not catching up with the technical instructions, offered to assist in forming some symbolic and graphic responses during the exam.

It is displayed through Figure 4 that 41% of the participants conveyed their concerns of having the exam focus shifted, to some extent, to managing it well on a virtual platform and to getting acquainted with its technical instructions to provide the solutions. They also expressed that the superfluous time elapse caused due to forming the responses on paper and reproducing those virtually was another factor preventing them from efficiently handling their exam.

Figure 5 points to a majority of learners believing that if it were not for the extraneous strain of dealing with insufficient command of technological manipulation of a virtual exam, they would have performed well. It is not the supplemental technological skills they minded learning about, it is the lack of guidance and practice on this front that got in the way of their factual performance. The dissatisfaction of 52% of the participants, coveting to function better in a traditional exam construct, sends an alarming bell to have taken this matter seriously. To address this issue, it is imperative to have the virtual assessment trainings executed frequently to allow the students to adapt to the tech environment on a dot.

Figure 6 brings out a considerable majority of 55% of the total participating students not in favor of appearing in the virtual assessments in the future. They strongly expressed that the apprehension

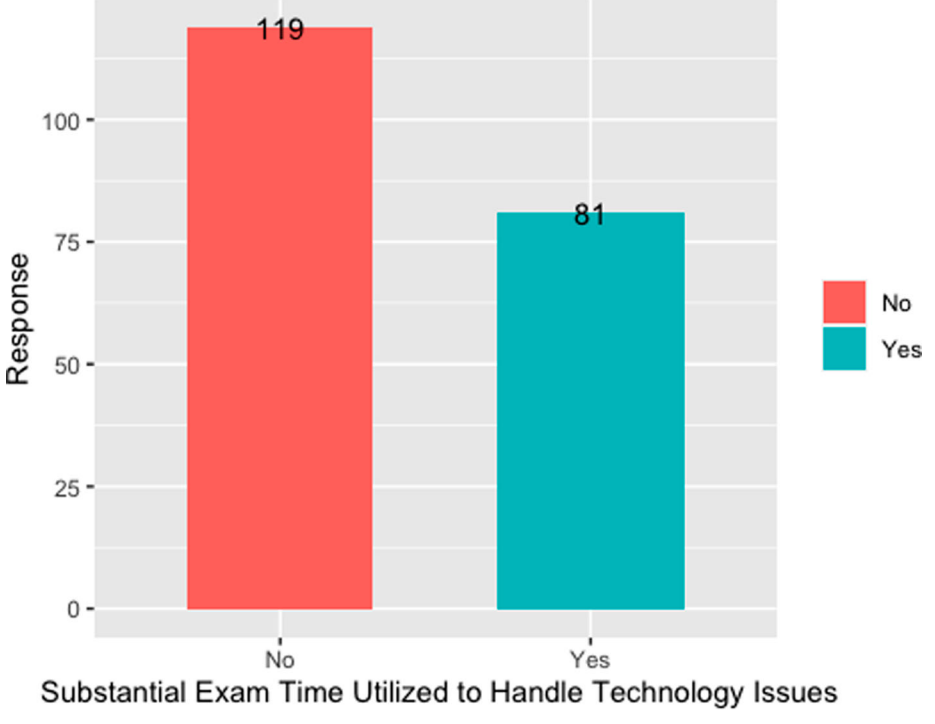


Figure 3. Substantial exam time utilized to handle technology issues.

Figure 4. Exam focus slightly shifted to handling online exam concerns.

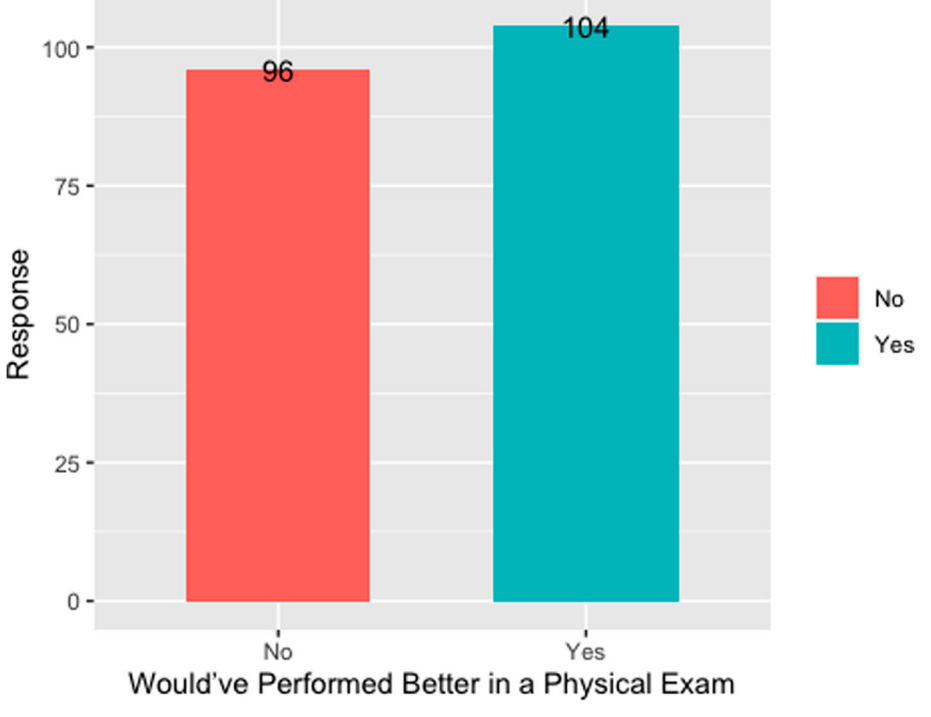


Figure 5. Would've performed better in a physical exam.

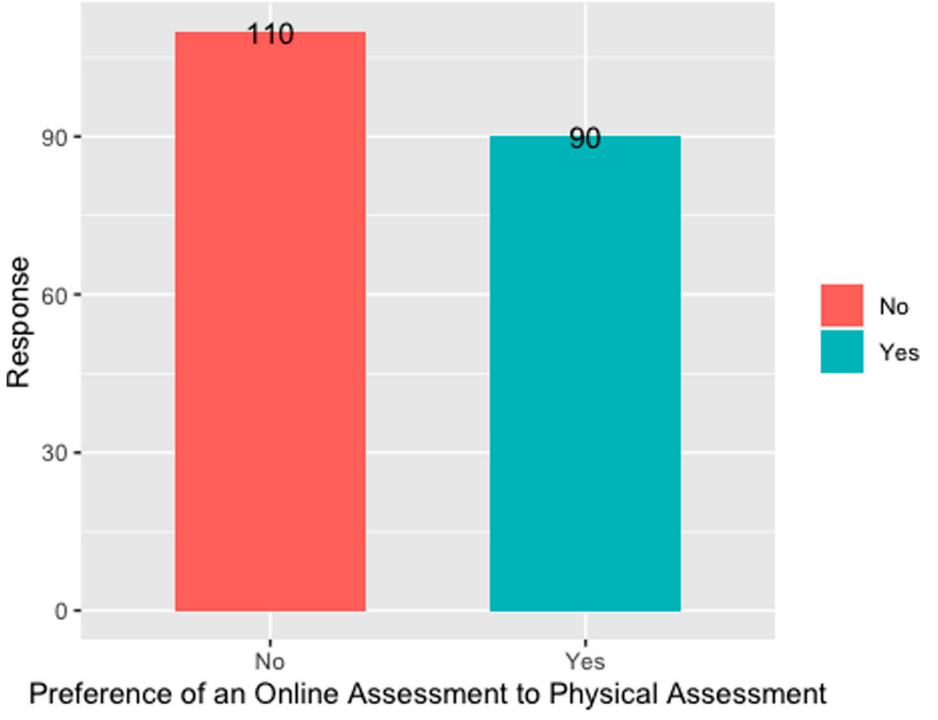


Figure 6. Preference of an online assessment to physical assessment.

of not being able to fully provide the response in an online habitat despite knowing the answer just added to the needless burden and interfered with their optimal exam performance. Moreover, they noted that class ambience and absence of surrounding distractions played key roles in keeping the focus of students intact, hence contributing to satisfactory assessment performance.

5. Limitations of output-enhancing virtual assessment implementation

The decline in students' virtual assessment performance as suggested by current data analysis is due to the limitations of the underdeveloped framework for online testing and the rigidity of available platforms to satisfy the needs of a diverse group. Despite the availability of an exam coach, a virtual testing environment cannot cater to students' individual exam queries simultaneously. This complication calls for reinforcing a possible set of queries, creation of their efficient responses data bank and its access to students prior to an online exam. The obstacle of an online assessment interruption due to the power shutdown can be fixed through offering the offline exams. However, this solution poses even a bigger challenge of asserting the unsupervised exam integrity. Another constraint causing a substantial agitation among the students community towards virtual assessment is the lack of platforms where symbolic and narrative responses can be incorporated together. An assortment of virtual platforms, furnishing the subject-based demands, is available but an easy access to such programs and their operative trainings hold out a budgeting dilemma. In order to manage the anxiety caused due to the time constraint and unfamiliar platform outlook, timed practice sessions could be offered. However, this solution requires a hybrid effort to keep a balance between instructors' workload, resources procurement and time management. In view of the hindrances encountered in offering an adequate online testing experience, it is imperative to develop a smart framework of virtual assessment that can cater to the twofold purpose of gauging students' knowledge and abating their fears of any compromise in e-testing.

6. Conclusion

The current survey-based study has been administered to highlight the obstacles encountered by the student community during virtual exams. This analysis has also examined the areas requiring improvement to improvise the digital exam experience of learners in the future. The obtained numerical proceeds suggest that a considerable majority of students expressed their inadequacy at not being able to cope with the brisk technical adaptation to a virtual assessment platform. They noted that they were insufficient to form graphic and symbolic responses, especially in mathematics and physics virtual exams, despite somewhat clear set of instructions provided for such subjects. They deemed this unsatisfactory performance to be caused by added stress to the exam anxiety and lack of tech training sessions on uniform digital quarters. A substantial number of students were not only unable to deliver the maximum subject-understanding in an online exam due to insufficient experience of technical manipulation but they also felt that their focus of responding to exam questions was slightly shifted to handling dispensable technological issues, causing the lapse of worthy exam time. The collected and analyzed responses also suggest a majority of students inclining to appear in physical exams in the future rather than dealing with the supplemental stress of complex tech administration.

The current article also highlights the necessity of allowing the students uniform access to virtual platforms and training sessions to better prepare them to adapt to the digital environment. An observation made through the present figures also entails the creation of simulating interacting platforms, embodying the classroom ambience, in order to reinforce the better learning experience.

Disclosure statement

The author declares that there are no competing interests in regards to current research and claims made in this article.

Notes on contributor

Nazish Shahid was a Fulbright Fellow in the Department of Mechanical and Aerospace Engineering at Princeton University, USA (2016–2017) OR Nazish Shahid is a former Fulbright Fellow in the Department of Mechanical and Aerospace Engineering at Princeton University, USA (2016–2017).

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