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Clínica Universitária de Oftalmologia

Pilot study on the impact of lectures and introduction of digital technologies in the knowledge acquisition in medical students

Sérgio Filipe Brito Teles

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Orientado por:

Prof. Doutor Luís Alexandre Pereira Abegão Pinto

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Abstract

Introduction: Academic teaching has been present in society for centuries. However, its methodology has not significantly changed. Though various articles were published analysing students´ satisfaction with the teaching method, there is still scarce data on the knowledge improvement associated with different methodologies. Therefore, the endpoints of this research were: 1) analyse the impact of Sophistic lectures in knowledge acquisition in medical students and 2) examine knowledge assessment using new digital technologies, compared with a more traditional paper-based method.

Methods: A repeated measures design was implemented in four classes of 4th year medical students, lectured by the same teacher on the same subject. A scientifically validated questionnaire was applied before and after each class, in paper and web-based tool *Sli.do* to two classes each. Results were compared by means of descriptive statistics.

Results: 55 answers were obtained in paper and 34 in *Sli.do*. Paper method questionnaires had mildly lower scores before and after class (46% and 74,2%, respectively) when compared with *Sli.do* (52,4% and 82,9%, respectively). Although basal scores were different among methods, both revealed a similar relative knowledge improvement, comparatively to the respective baseline (61,3% vs. 58,2%, respectively).

Discussion & Conclusions: The results showed that Sophistic classes are effective in learning, independent of evaluation method, which reassure that the task of the teacher is important and effective. This study supports the use of digital-based tools to assess learning in classes since they are more time-efficient, more ecological and logistically easier. Finally, assess the information that is being effectively taught to the students has several benefits for the teachers, the university and ultimately the students. Since a digital storage of the collected data makes it possible to carry out more effective internal audits over time, allowing the improvement of areas with lower results, benefitting the entire academic community.

Key-words: Teaching methodology; Technology; Knowledge acquisition.

This work points out the author´s opinion and not FML´s.

Resumo

Introdução: O ensino académico está presente na sociedade há séculos. No entanto, a sua metodologia não sofreu grandes alterações. Embora tenham sido publicados vários artigos a analisar a satisfação dos alunos com o método de ensino, ainda há pouca informação relativamente a qual o impacto de diferentes metodologias na aquisição de conhecimentos. Assim, os objetivos deste estudo foram: 1) analisar o impacto de palestras Sofistas na aquisição de conhecimentos em alunos de medicina e 2) avaliar a eficácia de novas tecnologias na avaliação da performance pedagógica, comparativamente com métodos mais tradicionais.

Métodos: Um esquema de avaliações repetidas foi implementado em quatro aulas de alunos no 4º ano de medicina, lecionadas pelo mesmo professor e sobre o mesmo tema. Um questionário cientificamente validado foi aplicado antes e depois de cada aula, em papel e na plataforma *Sli.do*, em duas aulas cada. Os resultados foram analisados através de estatística descritiva.

Resultados: Foram obtidas 55 respostas em papel e 34 em *Sli.do*. Em papel verificaram-se resultados moderadamente menores antes e depois das aulas (46% e 74,2% respetivamente) comparativamente ao *Sli.do* (52,4% e 82,9%, respetivamente). Embora os resultados basais tenham sido diferentes entre métodos, ambos revelaram um aumento relativo no conhecimento similar (61,3% vs. 58,2%, respetivamente).

Discussão & Conclusões: Os resultados revelaram que as aulas Sofistas são eficazes na aprendizagem, independentemente do método de avaliação, o que reafirma que o papel dos professores é importante e eficaz. Este estudo suporta o uso de plataformas digitais para avaliar a aprendizagem em aula, uma vez que estas são mais tempo-eficientes, ecológicas e logisticamente exequíveis. Por último, analisar a informação que está efetivamente a ser transmitida aos alunos conduz a vários benefícios para toda a comunidade académica, uma vez que permite a deteção de áreas passíveis de serem melhoradas e a possibilidade de realizar auditorias internas mais eficazes ao longo do tempo.

Palavras-chave: Metodologia de ensino; Tecnologia; Aquisição de conhecimentos.

O Trabalho Final exprime a opinião do autor e não da FML.

Resumo Alargado

Introdução: O ensino académico está presente na sociedade há séculos. No entanto, a sua metodologia não sofreu grandes alterações ao longo do tempo, mantendo a mesma organização baseada em aulas expositivas por parte dos professores - Método Sofista.

Embora tenham sido publicados vários artigos a analisar a satisfação dos alunos com o método implementado, ainda há pouca informação relativamente a qual o verdadeiro impacto de diferentes metodologias na aquisição de conhecimentos. Este défice de informação ocorre porque é um aspeto difícil de avaliar.

Tendo em consideração que alguns dos componentes mais importantes para uma aprendizagem eficaz são a atenção, a curiosidade e a motivação dos alunos, também tentámos compreender se a introdução de novos métodos digitais de avaliação está associada a melhores resultados na aprendizagem e quais as suas vantagens e desvantagens face a métodos mais tradicionais. A plataforma digital em estudo foi a ferramenta *Sli.do* (Bratislava, Eslováquia), que permite a realização de questionários interativos.

Assim, os objetivos deste estudo foram: 1) analisar o impacto de palestras Sofistas na aquisição de conhecimentos em alunos de medicina e 2) avaliar a eficácia da introdução de novas tecnologias na avaliação da *performance* pedagógica, comparativamente com métodos mais tradicionais.

Métodos: Foi elaborado um estudo experimental prospetivo através de um esquema de avaliações repetidas, realizado na Faculdade de Medicina da Universidade de Lisboa no ano letivo de 2017-2018.

Foram selecionadas quatro aulas de alunos do 4º ano de medicina, lecionadas pelo mesmo professor e sobre o mesmo tema. O tema escolhido foi Glaucoma uma vez que o conhecimento *a priori* desta patologia entre os alunos foi considerado básico, sendo assim mais suscetível de detetar alterações.

Foi realizado um questionário, cientificamente validado e publicado, em formato anónimo, antes e depois de cada aula. Em formato de papel em duas aulas e através da plataforma *Sli.do* nas restantes duas. O questionário consistiu em 11 perguntas sobre epidemiologia, fatores de risco, sintomas, diagnóstico, tratamento e consequências do

Glaucoma, todos tópicos abordados na aula. As respostas foram classificadas numa escala de 0% a 100%, de acordo com a percentagem de respostas corretas.

Os resultados foram analisados através de estatística descritiva. Não foi possível realizar testes estatísticos mais específicos, como uma análise de variância (ANOVA), porque a plataforma *Sli.do* não fornece os resultados descriminados individualmente.

Resultados: De um universo de cerca de 320 alunos de medicina inscritos no 4º ano verificou-se que apenas um total de 109 compareceu às aulas, o que representa uma taxa de assiduidade de 34%.

Combinando os resultados provenientes das quatro aulas, obtivemos 55 respostas ao questionário em papel e 34 em Sli.do (100% e 63% taxa de adesão, respetivamente). O número de respostas antes e depois das aulas foi o mesmo em ambos os métodos, o que significa que não houve desistências.

O grupo que respondeu em papel apresentou resultados moderadamente menores antes e depois da aula (46% e 74,2%, respetivamente) quando comparado com o grupo que respondeu através do *Sli.do* (52,4% e 82,9%, respetivamente). Embora os resultados basais tenham sido diferentes entre métodos, ambos revelaram um aumento relativo no conhecimento similar (61,3% *vs.* 58,2%, respetivamente).

Discussão e Conclusões: Os resultados revelaram que as aulas Sofistas são eficazes na aprendizagem, independentemente do método de avaliação, o que reafirma que o papel dos professores é importante e eficaz.

No entanto, a taxa de assiduidade foi de apenas 34%, o que infelizmente suporta a premissa de que atualmente, na Faculdade de Medicina da Universidade de Lisboa, palestras académicas facultativas têm uma taxa de adesão muito reduzida entre os alunos.

Verificou-se uma maior participação nas aulas em que foi utilizado o método em papel do que nas aulas em que se utilizou o Sli.do (100% vs. 63%, respetivamente). Este fenómeno pode ser explicado na medida que nas aulas em que os alunos responderam em papel houve uma relação cara a cara entre aluno e professor o que, de certa forma, mesmo sendo a participação opcional, aumenta a responsabilidade da tarefa, tornando menos provável a não participação por parte dos alunos. Assim, embora seja um método inerentemente mais demorado, a sua vantagem aparenta ser uma maior taxa de participação, diminuindo o risco de viés de seleção.

Por outro lado, plataformas digitais como o Sli.do, implicam uma participação mais oculta por parte dos alunos podendo levar a um viés de seleção, uma vez que apenas os mais interessados e motivados a participar o farão. Problemas técnicos e a necessidade de ter disponível dispositivos capazes de aceder à plataforma também são aspetos a ter em consideração e que podem ter levado a uma redução na participação.

Apesar de os resultados não revelarem grandes diferenças, este estudo apoia o uso de ferramentas digitais para avaliar a transmissão de conhecimentos durante as aulas. Este apoio advém do facto de a quase completa sobreposição de resultados entre os dois métodos sugerir que a perda no número de participantes não está associada a diferentes conclusões. Assim, é mais vantajoso a utilização de métodos digitais uma vez que são mais tempo-eficientes, ecológicos e logisticamente exequíveis a longo prazo.

Outro fator importante para este apoio, embora não tão evidente, é que embora a variação relativa no conhecimento tenha sido semelhante em ambos os métodos, é necessário ter em consideração o conhecimento basal de ambas as populações. Como os resultados iniciais foram melhores com o *Sli.do*, esta é uma população mais difícil de melhorar devido a uma menor margem de progressão. Contudo, como a variação se revelou semelhante, suporta que os alunos avaliados e integrados nas aulas através de novas tecnologias têm benefícios em termos de aquisição de conhecimentos.

Num aspeto final, avaliar a informação que está efetivamente a ser transmitida para os alunos nas aulas conduz a vários benefícios para toda a comunidade académica, uma vez que o armazenamento digital dos dados colhidos permite a deteção de áreas passíveis de serem melhoradas e a possibilidade de realizar auditorias internas mais eficazes ao longo do tempo.

Um exemplo específico destes benefícios foi observado na pergunta 10, uma vez que em ambos os métodos verificou-se uma redução na percentagem de repostas corretas após a aula (3% em ambos os métodos). Embora se trate de um valor reduzido, demonstra que esta informação em particular não foi transmitida eficazmente para os alunos, não devido ao método porque a variação foi a mesma, mas devido a alguma falha de comunicação ou por não ter sido referido na aula.

É importante referir algumas das limitações que detetámos e que são um incentivo para no futuro se realizarem mais estudos que as corrijam. Em primeiro lugar, embora tenhamos alcançado um número razoável de participantes (89 alunos), consideramos

que com uma amostra de maiores dimensões os resultados seriam mais representativos. Em segundo lugar, embora tenha sido o mesmo professor a palestrar as quatro aulas integrantes do estudo, é impossível recriar na íntegra quatro aulas dispersas ao longo de um ano letivo. Por último, como já foi referido, não foi possível realizar testes estatísticos mais específicos porque a plataforma *Sli.do* não fornece os resultados descriminados individualmente.

Esperamos, com este estudo, ter impulsionado e motivado outros professores, académicos e investigadores a valorizarem mais as metodologias de ensino e a procurarem melhores formas de estimular intelectualmente os alunos, de modo a que possamos beneficiar no futuro da sua excelência.

Table of Contents

Introduction

Academic teaching has been present in our society for centuries. However, its methodology has not significantly changed with time, keeping the same organization based on thematic oral exposure - Sophistic Method.[1]

Though various articles have been recently published analysing the satisfaction of the students with the teaching method implemented, which is undoubtedly an important aspect, there is scarce data on the level of knowledge improvement associated with different methodologies, which is even more crucial in education.[2]

This lack of information occurs because it is difficult to determine it. One aspect behind this unmet information is that students are already subject to a myriad of academic evaluations, ranging from OSCEs, clinical cases discussions, oral and written exams, which provide the basis for the final grades in each discipline. However, the main caveat in these evaluations is that it is not known how much of the knowledge assessed at the end of the semesters depends on individual study prior to the exam, rather than the level of knowledge transmitted in the classroom.[3] This is a major point that should interest Universities and Faculties, since a deeper insight into this problematic can help monitor, and if so needed, identify areas for improvement at the pedagogical level.

One way of studying the impact of the lecture in knowledge acquisition by the students is with a validated questionnaire, presented before and after it, and analysing the variation. Nevertheless, traditional questionnaires are a cumbersome task, as they are usually paper-based. The time-consuming task of making such assessment twice in a classroom has so far shown it to be unfeasible in regular classes.[4]

With this line of thought, we also tried to understand if the introduction of new digital tools in the classroom stimulates learning, considering that some of the most important components for an effective teaching are attention, curiosity, interest and motivation by the students.[5] The technology implemented was the web-based tool *Sli.do* (Bratislava, Slovakia), which allows real time interactive questionnaires.

Therefore, the endpoints of this research were to 1) analyse the impact of Sophistic lectures in knowledge acquisition in medical students and 2) examine if the introduction of new digital technologies in classroom have better results in performance analysis when compared with a more traditional paper-based method.

Methods

This was a prospective interventional study involving a repeated measures design, performed at Faculty of Medicine of the University of Lisbon during the 2017-2018 academic year.

From a universe of approximately 320 students enlisted in the 4th year, our university structures the classes, due to logistics and to improve the teacher-student ratio, in four of 80 students each, divided throughout the year. The class subject was chosen to be Glaucoma because the baseline knowledge was deemed to be basic among all students and thus more suitable to detect changes. Both the teacher and the content of these four classes were the same.

We presented the anonymous questionnaire, before and after each class, in paper format to two classes of students and in *Sli.do* format to the other two and compared the results.

In order to authenticate the web-based tool in study (*Sli.do*) and its accessibility for the target population we previously validated it with a method called Dummy Procedures, in a group of Ophthalmology residents. Afterwards, we evaluated precisely the accessibility to the target population by presenting the questionnaire to a small group of 4th year medical students.

We applied a scientifically validated and already published questionnaire, which was also validated for this specific target population - medical students with Portuguese as native language.[6] This questionnaire consisted in 11 questions about epidemiology, risk factors, symptoms, diagnosis, treatment and consequences of glaucoma, all topics covered during class. Answers were ranked from 0-100%, according to their correctness.

The results were analysed by means of descriptive statistics. We weren´t able to perform more specific analysis tests, such as an analysis of variance (ANOVA), because *Sli.do* doesn´t provide the results in a discriminatory way person by person.

Results

From a population of 320 medical students enlisted in the 4th year there were only a total of 109 attending them, which represents an attendance of 34%.

Combining the results from the four classes used as sample, completing an entire academic year, we obtained 55 answers to the questionnaire in paper, out of 55 attending students, and 34 in *Sli.do*, out of 54 (100% and 63% answer rate, respectively). The number of responses before and after class were the same in both methods, meaning there were no dropouts.

The combined results showed that the group who answered in paper had mildly lower scores before and after class (46% and 74,2%, respectively) comparing with the group who answered through *Sli.do* (52,4% and 82,9%). Although basal scores were different among methods, both revealed a similar relative knowledge improvement comparatively to the respective baseline (61,3% *vs.* 58,2%) (Figure 1).
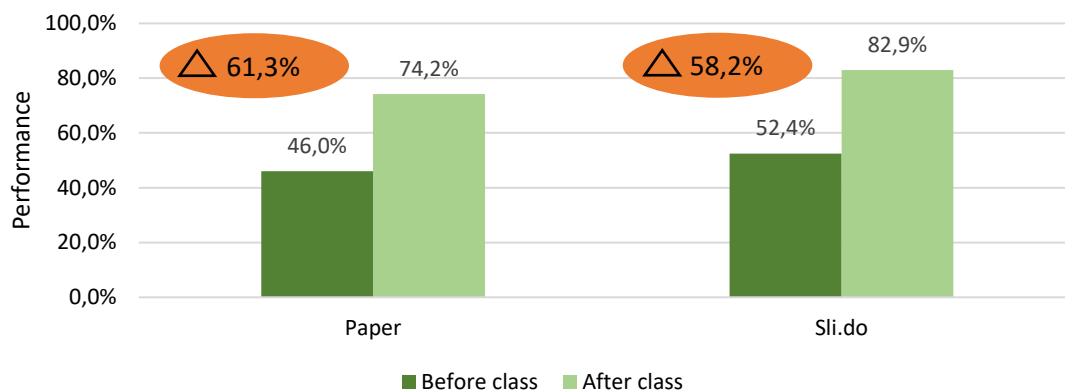
Figure 1 - Results to the questionnaire, with different assessment of knowledge methods, before and after classes.

As previously referred, the questionnaire consisted in eleven questions of which two do not have a right or wrong answer being 1) Do you have someone in the family with glaucoma? and 11) Do you consider the knowledge acquired during the medical course enough to recognize a possible glaucoma case?. This makes that 9 of the 11 were direct questions with one or more correct answers, adequately indicated.

The results obtained, before and after class, and the knowledge variation observed (positive or negative), relatively to the respective baseline for each question, are shown in Table 1.

	Paper			Sli.do		
	Before Class	After class	Δ	Before Class	After Class	Δ
2. What is the most prevalent cause of irreversible blindness in the world?	28%	46%	64%	30%	70%	133%
3. Blindness associated with glaucoma is:	44%	95%	116%	47%	97%	106%
4. What´s the most common type of glaucoma?	41%	91%	122%	29%	89%	207%
5. Which of the following are cause of primary open-angle glaucoma?	41%	68%	66%	37%	86%	132%
6. Which of the following are major risk factors for primary open-angle glaucoma?	48%	54%	13%	55%	56%	2%
7. Which of the following are signs and symptoms of primary open-angle glaucoma?	30%	84%	180%	51%	79%	55%
8. Which are the more common exams in a glaucoma?	62%	68%	10%	74%	88%	19%
9. How can glaucoma be treated?	52%	92%	77%	63%	100%	59%
10. When glaucoma´s treatment is effective it promotes:	69%	68%	-3%	84%	82%	-3%

Table 1 - Results to the questionnaire, before and after class, and the impact in knowledge acquisition observed for each question.

Questions number 2, 3, 4, 5, 7 and 10 only have one right answer so the improvement represents exactly the percentage of students that did not know the answer before the class and after responded correctly. However, questions number 6, 8 and 9 have multiple right answers (adequately indicated) so the improvement revealed corresponds to an average of the number of correct answers.

Discussion

The results showed that classes, specifically those based on the Sophistic method (oral exposure of contents by the teacher), are effective in learning, independent of knowledge improvement evaluation method, since they revealed a similar increment in global knowledge acquisition on the subject at study (approximately 60%), relatively to the respective baseline. These are results that reassure the task of the teacher is unquestionably important and effective and should encourage students to attend more frequently theoretical classes.

However, of the entire population of 4th year medical students enlisted in Lisbon Medical University, the attendance to these optional lectures was only of 34%, which unfortunately supports the premise that, in present days, facultative academic lectures have low attendance rates.[7]

As can be seen in the results, there was a higher participation in the classes using paper than those with *Sli.do* (100% and 63% answer rate, respectively). This can be explained since in the classes that answered in paper, there was an inevitably face-to-face rapport between interviewer and interviewee, which in some way originates a personal responsibility making it less likely for the interviewee to actively deny participation. While inherently more time-consuming, the advantage of paper-based questionnaires seems to be a higher rate of responders, which decreases the risk of participation bias, thus making the results more generalizable to the intended population.

On the other hand, web-based questionnaires, such as *Sli.do*, imply a masked approach where the faceless invisibility provided by technology can create a selection bias, since it is more likely that only students more interested and keen to participate would reply. Furthermore, technical issues inevitably associated with any such internet-based option, such as requiring a mobile phone or computer with battery connected to the university wireless or with data, could have decreased response rates.

The baseline difference of knowledge between the two groups was not very different, being slightly bigger with *Sli.do* (46% vs. 52,4%), which doesn´t precisely mean that the classes in which were given the questionnaires in paper had less overall knowledge of glaucoma than the classes using *Sli.do*. More probably might indicate that the facultative utilization of digital technologies, as previously referred, selected a more motivated group of students and therefore most probably to have prepared the class

beforehand. However, it is important to point out that being motivated does not directly correspond with being more *connoisseur* of the subject.[8]

Interestingly, despite non-significant differences in results, this study supports the use of digital-based tools to assess and increase knowledge transfer during classes.

Though a selection bias with the web-based method is possible, the almost complete overlap of results between the two approaches suggest that the loss in the number of participants is not associated with different outcomes. Considering this, there are undeniable important factors that support the change for a more digital way of evaluation, while on the meantime not jeopardizing the final outcome. These factors are: ecologic - using digital tools allows us to save paper (reducing deforestation), being more time-efficient - it´s a faster method of collecting and analysing data, and being logistically easier in the long term - although it involves an initial effort in creating the questionnaire in the platform, it can be reproduced every semester with no need of creating it again. Accordingly, interpretation and eventually fine tune of the pedagogical approach, if necessary, would be the same in both types of assessment.

Another important aspect that supports it, although not as expressive, is that although relative values of improvement in knowledge were similar, it is necessary to have in consideration the starting point of both populations, and since basal scores were better with *Sli.do*, and thus more difficult to improve, it shows that people who are a integrating part of the class through the use of digital tools benefit in terms of knowledge improvement.

There are various possibilities to be considered by teachers and universities to not disregard the non-participating students associated with web-based methods, involving all class in this beneficial teaching. If before a compulsory lesson, the presence list that traditionally is made by a signature in a paper can be changed to the record that the student answered the questionnaire in the platform, or in order for the student to have access to its grade he needs to have answered the questionnaire. These are just two examples on how to encourage student's participation, and each professor or academic committee should analyse and discuss the best way to implement it on its specific student population.

Nevertheless, we encourage investigators to design and implement new studies to more accurately understand what the real value of improvement in knowledge is when all the class is involved.

On another subject, using a web-based tool like *Sli.do* to assess the information that is being effectively taught to the students by the teachers has several benefits for the teachers themselves, the university and ultimately the students, since it allows the professors to find gaps in teaching in order to amend them and improve their own skills, and for universities to carry out an internal evaluation of the performance of the employed teachers, which consequently benefit the students.

A specific example of this benefit was observed in question 10, as both methods revealed a regression in knowledge. In this question, students showed a regression in their confidence that glaucoma when effectively treated can prevent blindness, questioning themselves if their basal knowledge (which was elevated - 69% in paper *vs.* 84% in *Sli.do*) was wrong. Although being a very small regression in the correctness of the answers (69% to 68% in paper, a relative decline of 3% *vs.* 84% to 82% in *Sli.do*, a relative decline of 3%), it demonstrates that this specific information was not effectively passed on to the students, not due to the evaluation method, because the variation was equal, but due to some failure in communication or not being referred in class.

Another example of how these in-class questions can help detect miscommunications during the teaching process are the replies to question number 6. Regarding this question, in both set of questionnaires, students vastly selected an incorrect option after the lesson (incorrectly replying hyperopia to be a risk factor for open angle glaucoma - 7% up to 42% in paper *vs.* 3% up to 37% in *Sli.do*).

In both cases, having performed questionnaires would have allowed the teacher to detect what was not being properly understood by the audience.

Since the introduction of new technologies seems to stimulate learning, we questioned what possible alternatives there were, besides interactive questionnaires, that could also be implemented in classrooms and benefit learning. We considered many hypotheses but the most inclusive and comprehensive was that a change in teaching panorama, from a Sophistic method to Flipped Classrooms, could be positive to knowledge improvement.[9]

Flipped Classrooms invert the usual organizational structure of the classrooms by providing educational tools and contents, such as recorded multimedia lectures, PowerPoints or other digital documents, before class, so students can view and study them outside of it and at their own pace. This asynchronous approach allows for more in class time for student centred learning activities, encouraging their participation and motivation through debates, presentations, questionnaires and other dynamics.[10]

We hope that, with this study, we further opened a door and encouraged other investigators to give more importance to methods in teaching and in finding better ways to reach the students, so in the future we can benefit from their excellence.

On a different matter, in the literature research we had access to various scientifically validated questionnaires. However, most presented some limitation to the objective, such as they were not in the mother tongue of the population at study (Portuguese) and they were not designed to it, being more appropriate for patients and their knowledge of this disease. Therefore, we choose the validated questionnaire that better accomplishes our specifics.

Although we did our best to minimize the limitations of this study by executing it the most impartial, professional and correct way, it is important to point out some of the limitations that we encountered in our study, which are an incentive for further studies. First, although we gathered a reasonable number of students (a total of 89), we think that with a larger sample it would be more representative of the population at study. Second, although we had the same professor lecturing all four classes and he prepared himself to give the best lecture possible and the most equal between them, it is still impossible to recreate exactly the same 4 classes of 50 minutes each, separated over a year, which might explain some of the result already discussed. Finally, as previously referred, we were not able to perform more specific analysis tests, such as an analysis of variance (ANOVA), because *Sli.do* does not provide the results in a discriminatory way person by person. Therefore, it was not possible to evaluate the statistical significance of the results obtained, being the results analysed by means of descriptive statistics.

Acknowledging these limitations is a needed step for, in the future, designing new studies that amend these aspects and consequently develop the knowledge on this subject, so we can all benefit.

Conclusion

Academic lectures based on the Sophistic method are effective in learning, independent of knowledge improvement evaluation method, resulting in an increase in knowledge of approximately 60%, relatively to the baseline results.

Web-based tools as a method of knowledge acquisition evaluation provide similar results compared to a more classic paper-based method. However, since it is an approach associated with clear advantageous it supports its implementation.

Additionally, assessing the information that is being effectively taught to the students allows for teachers to monitor and adapt their pedagogical methods and for Universities to carry out more effective internal audits over time, benefitting the entire academic community.

Disclosure

The authors declare that they have no conflicts of interest related to this work. The authors alone are responsible for the content and writing of this study and are not associated with the tools included and studied in it.

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Annexes

1. Validated Glaucoma Questionnaire

Questionário sobre Glaucoma

1. Tem alguém na família com glaucoma?

☐ Sim
☐ Não
☐ Não sei

2. A causa de cegueira irreversível mais prevalente no mundo é:

☐ Catarata
☐ Glaucoma
☐ Degenerescência macular relacionada com a idade
☐ Retinopatia diabética
☐ Não sei

3. O glaucoma pode levar a cegueira. A cegueira do glaucoma é:

☐ Reversível com qualquer tratamento (clínico ou cirúrgico)
☐ Reversível apenas com tratamento cirúrgico
☐ Irreversível
☐ Não sei

4. O tipo mais comum de glaucoma é o seguinte:

☐ Glaucoma Primário de Ângulo Aberto
☐ Glaucoma Primário de Ângulo Estreito
☐ Glaucoma Congênito
☐ Glaucoma Secundário
☐ Não sei

5. São causas de Glaucoma Primário de Ângulo Aberto (assinale um ou mais):

☐ Fatores genéticos
☐ Pressão intraocular elevada
☐ Infeção
☐ Não sei

6. Assinale os principais fatores de risco para o Glaucoma Primário de Ângulo Aberto (um ou mais):

☐ Pressão intraocular elevada
☐ Hipertensão arterial
☐ Diabetes
☐ Doenças neurológicas
☐ Pacientes jovens
☐ Hipermetropia
☐ Miopia
☐ História familiar de glaucoma
☐ Trauma ocular
☐ Uso de corticosteróides
☐ Raça Negra

7. Com relação aos sinais e sintomas do Glaucoma Primário de Ângulo Aberto, assinale aquele(s) mais comum(s):

☐ Perda súbita da visão central
☐ Dor ocular
☐ Olho vermelho
☐ Lacrimejo
☐ Cefaleia periocular
☐ Cefaleia frontal
☐ Fotofobia
☐ É na grande maioria das vezes assintomático
☐ Não sei

8. Perante um glaucoma, os principais exames são (assinale uma ou mais das seguintes alternativas):

☐ Avaliação da acuidade visual
☐ Fundoscopia
☐ Avaliação da pressão intraocular (tonometria)
☐ Perimetria visual
☐ Ressonância Magnética Nuclear
☐ Não sei

9. O tratamento do glaucoma pode ser feito com (assinale uma ou mais das seguintes alternativas):

☐ Colírios
☐ Cirurgia
☐ Laser
☐ Não existe ainda tratamento
☐ Não sei

10. O tratamento do glaucoma, quando eficaz, promove:

☐ A cura da doença
☐ O controlo da doença, evitando-se a cegueira
☐ Alívio sintomático, porém a progressão para a cegueira é inevitável
☐ Não existe ainda tratamento
☐ Não sei

11. Considera que os conhecimentos obtidos durante o curso de medicina são suficientes para reconhecer um possível caso de Glaucoma Primário de Ângulo Aberto?

☐ Sim
☐ Não

Obrigado pela colaboração.

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