Original Article

What's best, online or on-site? The write a scientific paper course

ABSTRACT

Background: The ability to publish is a career-critical skill but requires the acquisition of a wide and disparate skill set. The Write a Scientific Paper (WASP) course was created in Malta in 2010, an intensive, three-day event. WASP is an accredited event held in Malta, London, and Bahrain. The COVID pandemic forced WASP to go online. This study compared satisfaction with WASP online as opposed to in-person by analyzing course feedback pre- and post-pandemic.

Methods: Google forms are used to collect anonymous feedback on a Likert scale for various aspects of each WASP. The period 2017 to 2022 was used to compare four courses on-site and five courses online. Feedback on: Rate lectures, handouts, WASP overall and how likely are you to recommend WASP was compared.

Results: Response rates were >60% and almost all Cronbach's Alpha values were >0.7. High satisfaction scores were achieved in all four questions (>4/5). There were no significant differences except in lectures, which scored well but fared slightly worse overall online.

Conclusions: Migrating online does not necessarily lead to change/s in presentation contents but transforms delivery. Our results indicate that WASP is accepted online but the slightly lower lectures score implies that WASP might be better delivered in-person than online. However, students remained happy to recommend WASP and this accords with other studies that overall, student satisfaction with online education is common. It is hoped that as the pandemic recedes, webinars complement and not continue to totally replace traditional in-person meetings.

Key words: Biostatistics, computers, PowerPoint, presentations, research, software

Introduction

The ability to write up one's research is a career-critical skill, acceding to the "publish or perish" mantra. However, this requires the individual to learn a wide and disparate series of skill sets, a gamut that ranges from literature review, to proposal, to grant applications, to ethics to data protection, to data collection to analysis. One then proceeds with writing, to creating abstracts and/or posters and/or presentations, to paper formatting and referencing software, to submission and peer review to perhaps a dissertation. These skills are typically acquired piecemeal and haphazardly. For this reason, a group of Maltese medical academics came together in 2010 to create an intensive, three-day course that would attempt to inform interested junior colleagues about these skill sets.

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The Write a Scientific Paper course (WASP - http://www.ithams.com/wasp/) was first held in 2010 in Malta and was held once or twice a year (per perceived demand) at the Malta Life Sciences Park adjacent to Malta's regional hospital.[1] Delegate feedback allowed the course to be refined and fine-tuned. WASP was also held at the Royal College of Paediatrics in London in January 2017 and at the University of Manana in Bahrain in April 2018. The WASP lectures are delivered by experienced academics and journal editors and the learning objectives for each talk are laid out in an online document (http://www.ithams.com/wasp/extras/upcoming/learningobjectives.pdf). Talks are given via PowerPoint presentations. A half-day is dedicated to practical, hands-on statistical analysis using bespoke sheets created for WASP, sheets that greatly extend Excel's native capabilities.

WASP was formally reviewed by peers from the European Board & College of Obstetrics and Gynaecology (EBCOG) and the Mediterranean Incontinence and Pelvic Floor Society (MIPS) in 2017 and after implementing the suggested changes, both bodies formally endorsed WASP, as did the Malta Medical Association (MAM) and several other Maltese medical bodies. WASP is accredited with 18 CME points. Certification is obtained via the Medical Association of Malta. WASP has also been approved by the Federation of the Royal Colleges of Physicians of the United Kingdom and by the Royal College of Paediatrics for 18 category one (external) CPD credits.

The COVID pandemic forced the course to go online (using Microsoft Teams) in 2020 with no other changes to the course content. An online course allows the facile inclusion of overseas faculty and delegates and the last course (21-23 Feb 2022) included ten delegates (40%) from Ghana via the HopeXchange program, with a greatly reduced registration fee.[2] The transition from on-site to online provided an opportunity to ascertain whether attendees prefer online as opposed to in-person courses by analyzing course feedback pre- and post-pandemic.

Material and Methods

Google forms are used to collect anonymous feedback on a Likert scale for various aspects of each WASP course. The spreadsheets generated were compared for the period 2017 to 2022 for four courses on-site and five courses online as per Table 1. Four common aspects were compared between onsite vs. online courses, as follows:
1. Rate lectures. These were rated individually and the scores for lectures were amalgamated.
2. Rate handouts (Excel sheets, datasets, papers).
3. Rate WASP overall.
4. How likely are you to recommend this course?

Data was in ordinal format (Likert) and processed in Excel. Cronbach's alpha was used for each course to measure the questionnaires' internal consistency.[3] The data were highly skewed overall toward high values, so the Mann-Whitney U test was used to compare on-site vs. online. The tests were applied in bespoke Excel sheets created for the WASP course.

Results

Response rates are shown in Table 1. The minimum response rate was >60% and the average response rate was >80%. Cronbach's Alpha values are displayed in Table 2 and all results except for the last course are in the acceptable (>0.7) range.[4]

The comparisons for onsite vs. online are shown in Table 3. High satisfaction scores were achieved in all four categories both on-site and online. There were no significant differences except in lectures, which scored well both on-site and online but fared slightly worse overall online than on-site.

Discussion

Multimedia theory has been extensively studied, most notably by the educational psychologist Richard E. Mayer.[5] His Cognitive Theory of Multimedia Learning is based on the fact that there are two channels for data entry to the brain: auditory and visual, acceding to older Dual-Coding theory, which avers that visual and verbal information are both

Table 1: Dates of WASP courses on-site and online, and response rates to feedback questionnaire

On-site	% response	Online	% response
Oct-17	76.2	Nov-20	96.6
Feb-18	61.1	Feb-21	76.9
Apr-19	65.8	Apr-21	85.7
Oct-19	91.7	Oct-21	70.8
		Feb-22	96.2

Table 2: Cronbach's Alpha results for all courses

	Cronbach's Alpha	Std. Alpha	G6(smc)	Average R
Oct-17	0.7344	0.7804	0.7365	0.5422
Feb-18	0.7704	0.7508	0.7596	0.4297
Apr-19	0.8651	0.8685	0.8666	0.6229
Oct-19	0.8746	0.8975	0.9700	0.6864
Nov-20	0.8057	0.7887	0.8191	0.4828
Feb-21	0.8431	0.8453	0.8537	0.5774
Apr-21	0.7453	0.7546	0.7026	0.5062
Oct-21	0.7958	0.7981	0.7936	0.4970
Feb-22	0.3205	0.3751	0.4633	0.1305

mentally used to represent information.[6] Mayer maintains that deeper learning occurs when information is presented simultaneously as text and graphics, and is based on 12 principles [Table 4].[5]

The application of Mayer's theory to PowerPoint results in effective presentation and it has been noted that the appropriate usage of Multimedia Learning Theory results in significant retention improvements when compared with presentations using more traditional methods, improvements which also applied to long-term transfer and retention.[7-9] Indeed, a systematic review demonstrated that the most frequent advice given to presentation design was to keep slides simple, with little detail and text, the inclusion of phrases instead of sentences and utilizing simple tables and visuals with a paucity of animations.[10]

However, the ongoing COVID pandemic has forced a move to online events and presentations.[11] Migrating online does not necessarily lead to change/s in PowerPoint contents but certainly transforms presentation delivery. For example, audiences may change, with attendance of individuals who might not otherwise have been able to attend, requiring tailoring of presentation content and/or style.[10] In addition, paralanguage is partly lost in online presentations. Paralangauage is the nonlexical component of communication during speech, such as intonation, pitch and speed of speaking, hesitation noises, gasps, sighs, throat clearing, gestures, and facial expressions such as smiles/frowns.[12] Body language during presentations is

also largely lost particularly with loss of eye contact. This is important as the 7-38-55% rule affirms that these percentages respectively account for the relative impact of words, tone of voice, and body language when speaking.[13] All of these factors may potentially fluster speakers and undermine confidence and PowerPoint timings, crucial components for any presentations.[14]

Modern technology fortunately allowed a swift transition to online meetings and presentations due to COVID but it must be borne in mind that substantial portions of potential audiences may have barriers to moving online in this way, and this includes poor network connections, data affordability, and hardware limitations.[15] Indeed, it has been shown that students' responses depend on their proficiency in employing online tools and technical ability to access online events.[16]

On the other hand, more connected individuals were faced with an excessive choice of meetings as webinars flourished and became major education avenues during the pandemic. While this paradigm shift was initially embraced, many became overwhelmed by the sheer number and frequency of events and it is hoped that as the pandemic recedes, webinars complement and not continue to totally replace traditional in-person meetings.[17]

Our results appear to indicate that WASP is accepted online but the slightly lower lectures score may imply that this course might be better delivered in-person than online. However, our attendees were happy to recommend WASP and this accords with the finding by other studies that overall, student satisfaction with online education is common, a finding common to both genders.[18] The low internal questionnaire Cronbach's consistency in the last course only is attributed to the inclusion of a large proportion of non-European attendees.

The message, for both online and in-person presentations, remains the same: avoid prolixity, complexity, and gaucheness - the key principles are simplicity, brevity, cogency, and clarity.[19]

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Conflicts of interest
Victor Grech is the founder, coordinator and faculty of the Write a Scientific Paper Course (WASP).

Sarah Cuschieri is a member of faculty of the Write a Scientific Paper Course (WASP).

Table 3: Medians and means for four questions on-site and online and Mann-Whitney U test comparison

		On-site	Online
Rate	Median	5.0	4.0
Lectures	Mean	4.5	4.3
Overall	$U=2065441, P<0.0001$		
Rate	Median	5.0	5.0
Handouts	Mean	4.6	4.7
	$U=3475.5, P=0.7$		
Rate	Median	5.0	5.0
WASP	Mean	4.6	4.5
Overall	$U=3146, P=0.2$		
Likely to	Median	5.0	5.0
Recommend	Mean	4.7	4.6
WASP	$U=3179, P=0.4$		

Table 4: Mayer's 12 principles of multimedia

1. The Coherence Principle	7. The Pre-Training Principle
2. The Signaling Principle	8. The Modality Principle
3. The Redundancy Principle	9. The Multimedia Principle
4. The Spatial Contiguity Principle	10. The Personalization Principle
5. The Temporal Contiguity Principle	11. The Voice Principle
6. The Segmenting Principle	12. The Image Principle

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