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VIDEO OR TEXT? BULLETS OR NO BULLETS? WHY NOT BOTH?

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Abstract Some students – which are, in terms of pop-psychology – more left-brain – prefer linear exposition, others – more right-brain ones – prefer 2-D images and texts with visual emphasis (e.g., with bullets). At present, instructors try to find a middle grounds between these two audiences, but why not prepare each material in two ways, aimed at both audiences?

Keywords: *Left-brain, right-brain, visual vs. text, bullets in teaching materials.*

FORMULATION OF THE PROBLEM

During the pandemic's lockdown, when all the classes were online, one of us (VK), in addition to lecturing over zoom, posted the verbatim texts of his lectures on the class website. To his surprise, several students commented that while appreciated these clearly and neatly typed lectures, they missed the usual drawing and writings on the board – drawings and writings made usually – to put it mildly – not in the best possible handwriting. Why?

No information was missing, the quality of writing is clearly better in the posted typed text, so what is the reason for this strange preference?

SIMILAR PROBLEMS AND THE RESULTING EXPLANATION

Similar experience. Why do we like to attend in-person conferences? One reason is that it provides opportunities for discussions and collaboration, but even attending a talk is sometime more helpful than simply reading the corresponding paper. Why is this?

To many conference participants, the bulleted slides provide a clearer understanding of the presented material than the actual paper. So maybe we should use

more bullets in our papers, make them look more like slides? Some of us tried that, and the reaction is mixed: some reviewers liked it, but many other reviewers felt that this makes the paper less understandable – exactly the opposite of what the authors tried to achieve.

How can we explain all this: general idea. Whether we talk about bullets versus text, typed lecture versus writing on the board, some folks like it, some don't. A natural explanation is that people are different, they have different preferences in acquiring information. We sometimes forget about these differences, we implicitly extrapolate our own preferences to others, and then we get surprised when it turned out that people are different.

How can we explain all this: pop-psychology explanation. One of the things that popular books and article mention about psychology is that there are two main ways how we get information, ways that are usually labeled as left-brain and right-brain (although these labels are, of course, an oversimplification).

- In what is called a left-brain approach, we gain information in a linear way, one fact after another, one idea after another. This is how we read texts, this is how we listen to the lectures.
- In what is called a right-brain approach, instead of the 1-D flow of information, we gain information by absorbing visual 2-D pictures. This is how we view what is written on the slides, this is how we view what is written on the board, etc.

Psychology also teaches that while all of us acquire information in both ways:

- some of us are more efficient in acquiring 1-D linear information and are less efficient in acquiring information presented in 2-D visual form, and
- some of us are more efficient in acquiring 2-D visual information and are less efficient in acquiring information presented in the 1-D linear form.

SO WHAT SHOULD WE DO?

What should we do? OK, we have explained the observed phenomenon, but what should we do?

How can we use this explanation to make us more efficient in conveying our ideas – whether it when teaching a class, when presenting a talk at the conference, or when preparing a publication?

- To some folks in the intended audience, 1-D presentation works better.
- To others, 2-D visual representation is more efficient,

so what should we do?

What people do now. At present, instructors, presenters, and authors try – empirically to find a compromise.

- If you simply present the to-be-published paper on slides, without bothering to add bullets or any other visual formatting – as some presenters unfortunately do – the result is usually a boring lecture, not a very efficient way of conveying information although some people in the audience seem to like it as a proper academic approach.
- On the other hand, lectures with lots of bullets, pictures, cartoon, etc. excite a significant part of the audience, but for quite a few folks sound more like art than science – and fail to be an efficient way to convey knowledge: they may remember the cartoons, but the substance is often lost.

So people try to find a middle way of combining both.

What we propose: an idea. But maybe a better approach is to explicitly acknowledge that these two types of people need two different presentations?

This idea is not as outrageous as it may seem. After all, people who work on applications of complex mathematical techniques to practical problems from science and engineering, while sometimes struggling to satisfy both audiences, often publish the results of the same research in two different venues:

- Detailed descriptions of the corresponding mathematical and algorithmic ideas are submitted to an appropriate applied mathematics journal. In such papers, only a brief mention is made of the corresponding problem from biology, geosciences, or engineering – a deeper description would not be understandable to the mathematical audience.
- On the other hand, a detailed descriptions of the corresponding applied problem and of its new solution are submitted to the related journals, and mathematical methods are only mentioned on the level of details understandable to the readers of these journals.

So why not use a similar idea of presenting the same result in two ways?

To some extent, this idea is already successfully used. Let us give a new examples.

- Many textbooks are now supplemented with slides in which the same material is presented in the 2-D visual form, as opposed to the mostly 1-D form of the textbook itself.
- Many journals and conference proceedings allow authors to post, on the publication website, not only the paper itself, but also additional files such as slides, videos (in particular, video abstracts).
- And in teaching, students have access to the (1-D) textbook – and to the lecture when the instructor uses (2-D) slides or writes on the board, and the results of such an instruction are usually much better than when the students only have a textbook (but no lectures) or only lectures (but no textbook).

From this viewpoint, what we propose is not a radically new revolutionary idea, what we propose is to explicitly acknowledge that the proposed duplication makes the conveying of information more efficient.

What exactly we propose.

- In publications, we propose to allow authors to post two versions of the same paper – a more traditional 1-D version oriented towards more left-brain audience and a bullet-filled 2-D version for more right-brain readers.
- In teaching, post both (1-D) lectures and (2-D) slides covering the same material, so that students of both cognition type will be able to gain from the most appropriate medium.

Yes, this will require more work from authors and instructors – but if this becomes widely spread, maybe tools will be designed that would help with producing such a dual output?

We hope that this modest proposal will help further enhance teaching.



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