Neither Technology Nor Pedagogy Should Come First In Design

The integration of ICT in education has been the subject of an intense debate for many years, especially regarding rationale, method, teacher training and evaluation. In this contribution, I would like to focus on the rationale: the justification we provide for using a specific technology in our learning and teaching contexts. Real or fabricated, conscious or subconscious, we can group the reasons for doing so into the following approaches or angles of attack.

- A technology-driven approach promotes the use of a technology based on its innovative features.
- A demand-based approach simply responds to needs mentioned by teachers and students.
- An affordances-based approach looks at perceived new activities for language learning and teaching.
- An acceptance-oriented approach focuses on the mental acceptance of a technology based on its perceived usefulness versus its ease of use.
- A motivational approach looks into how technologies can help to satisfy universal or individual psychological needs.
- An attribute-based approach analyses cognitive aspects such as the processing of visual, auditory and textual information.
- Finally, a pedagogy-based approach starts from a pedagogical theory such as socio-constructivism in order to justify the choice for and integration of a specific technology.

Seven approaches: two pragmatic, three psychological and one pedagogical. They almost never occur in pure form, nor have they succeeded each other over time. None are inferior in themselves, not even a technology-driven approach, which is now being regarded as less acceptable on an academic level. But, what is wrong with just using a new technology for testing purposes, as long as we are honest about it, explain it to our students and involve them, have fun, and build some 'wowledge'? Far worse would be if we claim some magic effect on the learners' brain, if we need technology to give us a reason to exist, or if we need to find problems for a given solution.

On the other hand, the pedagogy-based approach has acquired an aura of reviewer-proof scholarly rigor. More and more authors are eager to state in their research papers that they adopted a pedagogy-based approach. However, many quickly refer to some pedagogical theory without any correct reasoning, and most of them seldom forget to refer to the perfunctory Vygotsky. Scholarly lip service, which is not always reflected in the actual research design.
With this contribution we want to point out that *educational engineering* as an instructional design model might lead to a new approach which we have coined Distributed Design[1]. Without going into detail here and now about the specifics of this model, I would just like to explain why it might entail considerable consequences for the roles of technology and pedagogy in design.

No technology carries an inherent, measurable and generalizable effect on learning. This effect can only come from the entire learning environment as ecology, and it is proportional to the extent to which it has been designed in a methodological way. Technology is only one of the elements, which may contribute to the realization of the learning goals. As the eventual shape of the designed learning environment heavily depends on the context, the needed technological functionalities will also vary considerably according to local circumstances. Design creates the need for technology, but you never know in advance what the outcome will be. And that can be fun!

There is also no pedagogical model that we can apply as such in any context. Pedagogical theory is only needed during the pedagogical specification phase. You only know which knowledge or model you need after designing the overall concept as a compromise between often conflicting personal and pedagogical goals[2].

We need technology and pedagogy in order to create the most optimal ('powerful') learning environment. This need is the outcome of our conceptualization, and not its starting point.

This Distributed Design approach is still a kind of experimental treatment, or formulated in a more scholarly way, still in a phase of ongoing theoretical and empirical validation. For teachers, it is often being perceived as an *inconvenient truth* which does not seem to stand a strong chance against the *reassuring lies* conveyed in pervasive but persuasive terms like ‘blended learning’, ‘flipped classrooms’, ‘digital pedagogy’, ‘virtual worlds’, ‘digital natives’ etc.

Inconvenient truth, but emancipating at the same time. Teachers should become designers. Designers of their own learning environment. As designers, they become able to determine for themselves which technologies to use, how, when and with whom. As designers, they become able to explain why. By describing how they analyze their context, how they design their optimal learning environment in a methodological way, and how they specify the required technological functionalities and the pedagogical models (teaching, learning and evaluation models) they need in order to realize them. But teachers should also be enabled and empowered to do so.
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