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EVIDENCE-INFORMED TEMPLATE FOR GOOD PRACTICES OF EDUCATIONAL INNOVATION WITH TECHNOLOGY

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ABSTRACT

In higher educational institutes, much time and effort is invested in the innovation of learning designs with educational technologies. To see a return on investment, it is important to work in an evidence-informed manner by incorporating both scientific and practice-based evidence to guide design decisions, and by generating new evidence by systematically evaluating innovations. Research has shown that the use of good (or best) practices can be instrumental when trying to support innovations in practice. For practice-based knowledge to be informative in a different context, and for the outcomes to be scaled up to support a broader field of application, the knowledge output needs to be both transferable and generic. Good practices presenting knowledge about successful innovations appeal to practitioners and support the transfer of practice-based research into practice. Still, research into the use of best practices shows that often times important information is left out in the presentation of the example, making them less effective. The use of a template can remedy this problem. In this paper, we present an evidence-informed template to describe good practices of evidence-informed educational innovation using technology. We discuss the development of this template, how it can be used by educational professionals and we reflect on the experiences with participants that experimented with this template in our workshop at the EAPRIL conference.

INTRODUCTION

In higher educational institutes, much time and effort is invested in the innovation of learning designs with educational technologies. To see a return on investment, it is important to work in an evidence-informed manner: using knowledge from educational sciences as well as expert knowledge from practice in the innovation process will improve the chances of successful and sustainable implementation of the educational innovation.



However, not every educator is experienced in working in an evidence-informed way, for example because they cannot keep up with the evidence or they are lateral-entry teachers. Meanwhile, research shows that good or best practices can be instrumental in (scaling up) educational innovations. As such, there is a need for worked examples of ways in which we can improve our practice of educational innovation.

In this paper, we present a comprehensive template to describe evidence-informed ways to innovate learning designs using educational technology. We propose applying this template to describe good (or best) practices in order to enable the transfer of that practice to new contexts, and making it scalable to eventually benefit more learners.

In the next section, we describe our perspective on ‘evidence-informed practice’, what types of evidence we consider to be valuable to utilize in practice and three different perspectives on how evidence reaches educational practice. Next, we elaborate on why good practices can be useful in evidence-informed practice and how they should be described to be used effectively. Finally, we present the template we developed and reflect on the experiences of using the template, including those in the workshop we organised at the EAPRIL 2021 conference.

EVIDENCE-INFORMED EDUCATIONAL INNOVATION

Research by Hollands and Escueta (2019) shows that when decisions are made about the adoption of educational technology, or the upscaling of (small scale) innovations, less than twenty percent of practitioners use high quality evidence from scientific research literature. Most of the time only local ‘evidence’ is used, such as a professional’s own experiences, those of colleagues, or a small set of data from local IT systems.

Structured knowledge from scientific studies is generally easily found and shared, but is not that frequently taken up by professionals in practice (Mahroeian & Forozia, 2012). Because concept and theory development are emphasized over use in practice when research findings are disseminated, this knowledge will be difficult to access by professionals to apply in practice-based applications.

Using no evidence at all or low-quality evidence in an innovation process increases the risk that the intended (and expected) results will not be met, since evidence will be lacking to (1) guide the choices made in the innovation process, and (2) on the intended – and achieved – effects of the innovation. Innovations with educational technology will be less effective (and less efficient to implement) when the inclusion of insights from existing (scientific or practice-based) research is not part of the design approach (Davies, 1999).

Concluding, when it comes to innovating our education with technologies it is paramount to work in an evidence-informed manner. Some people use the terms ‘evidence-based’ and ‘evidence-informed’ interchangeably. We prefer to use



evidence-informed as it emphasizes that evidence is not the only factor influencing the innovation process in educational practice. The definition proposed by Nelson and Campbell (2017, p. 129) of evidence-informed practice (EIP) reflects this strongly: ‘EIP must be seen as the integration of professional judgement, system-level data, classroom data and research evidence.’

Types of Evidence

The term ‘evidence’ can be considered a little bit vague, which is why we give several examples of types of evidence we consider valuable in educational practice below. Of course, each of these types of evidence can be used in different ways in the innovation process. To innovate in an evidence-informed way, we need to base our innovation process on *practice-based evidence* (knowledge of successful innovative implementations) as well as *scientific evidence* (the underlying theoretical working mechanisms) (Nelson & Campbell, 2017; Nevo & Slonim-Nevo, 2011):

- *Practice-based evidence*, describing ‘what works where and for whom’, relating successful implementations to contextual factors. Examples of such evidence are context analyses, research into co-design, (didactical) usability studies, field studies, formative evaluations, prototyping, agile design methods, study data and good practice descriptions;
- *Scientific evidence* describing ‘what works and why’ substantiated with underlying theories. Examples of such evidence are (systematic) literature reviews, qualitative studies, empirical (lab) studies, summative research, and effect studies.

It is recommended to use various types of evidence in a single innovation process (evidence triangulation). One reason is that innovations which have been proven effective in highly-controlled scientific research will not automatically be effective in a specific context in practice. To adjust the innovation to the local circumstances in the implementation process, practice-based evidence (perhaps developed along the way) is just as important. On the other hand, evidence which has been developed through practice-based research is not automatically transferable nor generic, which is necessary for such evidence to be informative in a different context, and for the outcomes to be scaled up to support a broader field of application (Andriessen, 2016). Finally, it is recommended to not only base decision in the innovation process on evidence, but to also generate new evidence by evaluating the innovation and its effects systematically (Davies, 1999).

How Evidence Can Reach the Educational Practice

Evidence from research on innovations with educational technology can reach educational practice through three approaches;

- 1) research dissemination,



- 2) research valorisation,
- 3) research propagation (Froyd et al., 2017).

Seymour (2002) describes a dissemination approach as communicating to others about a successful initiative, after which the awareness and evidence of effectiveness will automatically lead to systemic adoption of the innovation. Of course, we know this is too optimistic and a mere dissemination approach does not tend to lead to adoption of innovations in practice (Henderson & Dancy, 2007; Yerushalmi et al., 2007), for instance because the approach does not consider customization of the innovation to (better) fit a local context, which in turn gives rise to barriers hindering adoption.

A valorisation approach (Benneworth & Jongbloed, 2010) incorporates activities to ensure that scientific knowledge adds value to society, for example by making scientific results openly available and accessible for utilization by people or companies outside academia. Sometimes, a valorisation approach also includes co-production of knowledge with non-academic stakeholders. However, valorisation is also sometimes framed as commercialisation, e.g. by initiating start-up companies that further develop and market promising prototypes developed in research projects. Unfortunately, the above approaches do not lead to systemic adoption of innovations to improve educational practice, e.g. because just a few non-academic stakeholders from a single context were involved in the co-production of knowledge, which hinders adoption in contexts that differ.

Froyd et al. (2017) argue that the propagation paradigm has the potential to produce better results than the dissemination and valorisation approaches. They characterize the propagation paradigm by an emphasis on both *fit* and *efficacy* of the educational innovation being developed. Such innovations are developed by a diverse team of stakeholders from different contexts, engaged early and often, with a focus on learning through engaging with potential users and adopters to promote successful implementation. The efficacy of the innovation, customized to fit the implementation context, is supported by both scientific evidence (explaining the efficacy of the innovation in general and relating it to a theoretical framework) and practice-based evidence (describing the customization to the local instructional system in terms of contextual affordances and barriers) (Froyd et al., 2017). A promising way to disclose practice-based evidence is by describing good practices, since they pay attention to the observed efficacy of the locally implemented innovation as well as the fit that was made.

GOOD PRACTICES OF EVIDENCE-INFORMED EDUCATIONAL INNOVATION

Findings from practice-based research can be recorded and communicated through good or best practices. The use of good or best practices can be instrumental when trying to support innovations in practice (Alwazae et al., 2015), especially as viewed from the propagation paradigm. Mostly the terms good practice and best



practice are used interchangeably, but in some definitions one may only call a practice a best practice when it has been proven to work better than other practices. In this paper, we choose to use the term *good practice*.

Good practices of evidence-informed educational innovation can describe a variety of types or aspects of evidence-informed ways of working, for example:

- How **existing knowledge** is made useful for (translation to) practice;
- How one can **identify** which practical **knowledge**/expertise for innovating is **missing**;
- How one can generate **new practical knowledge**/expertise;
- How one can realize **effective** educational design;
- How one can conduct student evaluations **with (scientific) reliability**;
- How one can establish the **effectiveness and efficiency** of innovative educational designs;
- How one can thoroughly think through our Blended Learning designs and make **supported** considerations;
- How to **scale up** innovations and make them **sustainable**.

Why Should We Use Good Practices?

Professionals in education are often missing tools and strategies for effective translation of theoretical and conceptual knowledge to local practices, limiting the return on research investment (Froyd et al., 2017). Good practices represent knowledge about innovations in a way that appeals to professional, since they offer insights into how an innovation fits into a local context, how affordances of the context were utilized and how barriers were broken down. Unfortunately, our practical experience is that not many professionals are actively using good practices to inform and substantiate their innovation process, possibly because they are not aware of their existence. In contrast, The IT sector has a long tradition of describing and using good practices, especially in software development, because they acknowledge learning from other professional's efforts will save time by 'not re-inventing the wheel' (Gamma et al., 1995). Using good practices to share knowledge about innovations is effective (Alwazae et al., 2015), since they:

- Pose **recognizability**: professionals will likely recognize their own context in the description of the innovation itself, the process, the stakeholders engaged, the barriers encountered and/or the success factors for implementation;
- Have the potential to offer **inspiration**: describing an evidence-informed educational innovation, and especially the way in which it improved practice, can make professionals enthusiastic to try a similar innovation with the hope of achieving the same results;
- Help increase the **self-efficacy** for innovation: reading about a successful innovation process by a peer in a similar institute can stimulate the professional's belief in their own capacity to develop similar practices;



- Aid to **demystify** the term ‘evidence-informed practice’: a comprehensive description of an authentic evidence-informed practice will help professionals to get a clear and realistic picture of the different types of evidence-informed educational practice.

Still, research into the use of best practices shows that often times important information is left out in the presentation of the example, making them less effective (Alwazae et al., 2015). The use of a template can remedy this problem.

How Should We Describe Good Practices?

Alwazae et al. (2015) state that too often important information is missing from good practice descriptions, which impedes their use. Because low quality or incomplete descriptions hinder the understanding of the practice, adoption and transfer of that practice will not occur (Dani et al., 2006; Limam Mansar & Reijers, 2007). Professionals that actively use good practices sometimes have a hard time finding and selecting relevant good practices they can use (Simard & Rice, 2007) and/or solid guidelines to record a good practice are missing (Shull & Turner, 2005).

Three attributes of effective descriptions of good practices are (Aggestam & Persson, 2010; Simard & Rice, 2007): (1) the intention of the developed case is described so that the value of the practice for the own practice can be assessed, (2) the approach or step-by-step plan adopted in the local context is described so that the feasibility in the own practice can be assessed, and (3) indications are included on how to apply the practice in other contexts.

To improve the effectiveness of good practices, Alwazae et al. (2015) have identified those elements that should be present in a description of good practices. For example, they included a category of elements that describe the requirements needed to apply the practice in a new setting, such as the goal, the means, the skills, the costs, barriers and barrier management. To facilitate the development of comprehensive descriptions of good practices of evidence-informed educational innovation using technology, we propose the template presented in this paper.

THE TEMPLATE

A template in general contains a set of predefined elements that guides the process of describing, as well as the resulting description of, a good practice. Using a template enforces completeness and clearness of a description and as such can facilitate the development of high quality descriptions of good practices (Alwazae et al., 2015). Templates for good practices can be used in different contexts and organisations; here, we use it to describe good practices of evidence-informed innovations using educational technology.

Below, we present our template. We believe in ‘practice what you preach’ and as such, we developed the template in an evidence-informed way. We have distilled



the necessary categories from the publication by Alwazae et al. (2015) and adjusted them in such a way that we can collect examples of evidence-informed practice.

The insights which are now reflected in the template are, for instance, that good examples should be action-oriented and solution-oriented; they are rich with context and thus recognizable; and they can spark conversation about transferability of the practice. Some of the categories, like 'Type of support for evidence-informed practices' and 'Evidence-informed ways of working' are specific for our own particular purpose of collecting examples of evidence-informed practices, but most elements can be used for collecting good examples of innovations in general.

Furthermore, we used literature about innovations in education using technology to better formulate the instructions and questions which are helpful in filling out the template. For example, we used an overview of how educational technology can be designed in an evidence-informed way by Price and Kirkwood (2014), and the book by Seel et al. (2017) about designing education based on evidence from scientific research.

This template contains evidence-informed elements for a concise and appealing description of good practices. During development of the template, we continuously had to navigate between concision and completeness. If someone would be interested in additional information, this should ideally be available upon request, which is why contact information for a professional involved in the good practice is included in the template.

On the website of the Dutch Acceleration Plan, different versions of the template can be downloaded: in Dutch and in English, PDF-versions and editable versions for Microsoft Word: <https://www.versnellingsplan.nl/en/Kennisbank/template-for-good-practices-of-evidence-informed-educational-innovation-with-it/>.

Table 3: Template Elements with Instructions for Users.

Element	Instructions / questions
Title	Title of the good practice – Attractive and concise
Goal	Describe why working in this evidence-informed manner is important; what is the benefit of working this way?
Target audience	Which target audience (community of practice) is likely to be interested in this good practice?
Type of support for evidence-informed practices	How is evidence-informed practice supported? Is this a good practice in which a practical instrument is used for support, is it a description of a working method without an accompanying tool, or a description of a realised innovation? (Please note: if the educational innovation has been realised in an evidence-informed way, please also describe the work method.)
Category	What theme(s) fit(s) this good practice best? Is this an example (or combination) of: <ul style="list-style-type: none"> • Valorisation of existing knowledge/evidence?



	<ul style="list-style-type: none"> • Creation of new (practice-based) evidence? • Dissemination of knowledge within or between institutes.
<i>Summary</i> - Issue (problem/opportunity) - Solution - Quality	What was the issue (question/wish) that induced (the development of) this good practice? ... What (type of) solution was developed? ... What makes this a <i>good</i> practice?
Context	In which context is the good practice set? (Please elaborate on the relevant aspects of the context on the development, and the success, of this good practice.
Approach	What characterizes the approach / work method? (For example, describe a step-by-step plan: activity 1,2,3).
Evidence-informed way of working	In which phase(s) of the innovation process was an evidence-informed practice adopted? A suitable five-phase model is ADDIE: Analyze, Design, Develop, Implement, Evaluate (Branch, 2009).
Evidence	If existing evidence was used in this good practice: what (type of) evidence was used? Scientific evidence? Practice-based evidence? ... What new evidence did this good practice yield? ... What was the result of this good practice within the context / for the student? ...
Stakeholders	Who was involved in this good practice? What roles and/with what competences?
Tools & instruments	Which technology, techniques and methods were utilized?
Challenges	What challenges had to be overcome? How can these challenges be tackled?
Success factors	Which factors have contributed to the success (and to tackling the challenges)?
Contact	Is a website available with more information about this good practice? Who can be contacted for more details?
Sources	References to any cited sources in the description of this good practice.
<i>Optionally</i>	<i>What other institutes also apply this evidence-informed practice?</i>



REFLECTIONS AND EXPERIENCES

We have developed an evidence-informed template for good practices of evidence-informed innovation with educational technology. This template provides a structure for the systematic and detailed description of these good practices to share practice-based evidence with the goal of scaling-up the innovation and transferring it successfully to different contexts.

In our online workshop at the EAPRIL 2021 conference, we presented the template to the participants and we offered a hands-on experience for them to get familiar with using the template to describe an educational innovation practice from their own professional context. All three workshop participants were lateral-entry teachers enrolled in a Master's programme.

Goal of the Template

The participants expressed the value they saw in the template mainly in terms of support to capture 'what works where for whom and why' in a specific educational practice. Furthermore, they observed another potential affordance of the template, i.e., to facilitate and guide further improvement of an existing practice.

We believe the template indeed can serve other purposes than the one we envisioned. For example, we agree with the participants of the workshop that the template can facilitate the process of assessing and improving existing educational practices, since it may bring to light which elements of the practice can potentially be improved or need extra substantiation. One way to improve an existing practice could be to use the quality criteria as presented in (Alwazae et al., 2015, pp. 255, Table 1). These criteria are very extensive and therefore we decided not to include all of them in our template.

Usage of the Template

The participants of the online workshop helped us to discover a convenient and effective approach to use the template in the process of describing a good practice. The person involved in the practice has extensive knowledge about the innovation, the process and the educational context, but will probably not be familiar yet with the template and its usage. However, both authors had – as co-developers of the template - extensive knowledge on the (elements of the) template and evidence-informed practice, but little knowledge on the specific educational practice of the participant. To get the most out of the workshop, one of the authors interviewed the participant describing their own practice, while the other author took notes of what was being said in the most appropriate section of the template. The interviewer asked probing questions to extract as much (tacit) knowledge as possible from the interviewee. The advantage of this approach is that the professional describing the good practice can tell their story without having to stick to the pre-defined order of



the template's elements. The disadvantage of this approach is that it requires three people simultaneously working with the template. In future work, different compositions and role distributions could be evaluated in terms of effectiveness and efficiency of filling out the template for a given good practice.

Concluding remarks

In this paper, we present an evidence-informed template to describe good practices of evidence-informed innovation using educational technology. As mentioned before, for concision purposes, we have not included all elements of good practices as presented in (Alwazae et al., 2015). One such excluded element is the estimation of time needed to introduce and implement a practice in another context. In future work, we wish to develop implementation guidelines and supporting materials to aid professionals that plan to apply a good practice in a new context.

Furthermore, evidence-informed ways of working have the potential to stimulate the continuing professional development of educators willing to innovate, since it may help to explicate tacit knowledge or working mechanisms, and create awareness of blind spots for improvement. Moreover, access to appealing descriptions of good practices of evidence-informed innovation can increase awareness of the added value good practices have in professional practice. How evidence-informed practice and continuing professional development can be – or potentially already are – integrated in educational practice is an interesting question to explore in future work.

Of course, using this template is only one way to support the development of evidence-informed practices. We believe this template facilitates a transition from a dissemination approach to a propagation approach. We cordially invite readers with different suggestions for approaches to achieve this transition to contact the authors.

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