Implementing educational innovations in higher education: from initiation to organizational routine





Acceleration plan
Educational innovation
with ICT





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Implementing educational innovations in higher education: from initiation to organizational routine

Introduction

Educational innovation using information technology (IT) has been a priority in higher education for many years, due to its impact on the quality and accessibility of higher education. Nevertheless, initiating and implementing innovations in this area is a complex and not self-evident process. Educational innovations often get stuck or even cease to exist. This is especially true for innovations that have been developed outside the context of one's own educational institution, for example, at a national level. It is therefore important to know what factors play a role in making innovations in an organizational routine. In response to this, the Facilitating Professional Development for Lecturers Zone (hereinafter: Lecturer Professional Development Zone) of the Acceleration Plan has investigated how their nationally developed innovations have been received by the 16 participating educational institutions and what factors support and hinder the innovation process.

Facilitating lecturer professional development is one of the themes of the 4-year Acceleration Plan for Educational Innovation with IT. The Acceleration Plan is a collaboration between the Universities of the Netherlands (Dutch: *Universiteiten van Nederland*; UNL), the Association of Universities of Applied Sciences (Dutch: *Vereniging Hogescholen*) and SURF. Together we focus on the opportunities that digitization offers higher education. We have three ambitions with regard to educational innovation with IT:

- 1. Improving the connection to the labor market
- 2. Improving flexibility of education
- 3. Smarter and better learning with technology

The Acceleration Plan is divided into seven thematic zones and three working groups (i.e., teams consisting of representatives of higher education institutions) in which 39 universities and universities of applied sciences work together towards these ambitions. The Lecturer Professional Development Zone, with 16 participating higher education institutions, is working towards a way in which institutions can give lectures effective support and professional development in the field of educational innovation with IT. To this end, various innovations have been developed to realize the desired acceleration in the field of educational innovation with IT within each educational institution.

An innovation can be defined as the deliberate introduction and application of new ideas, products or practices¹². In this study, two types of educational innovations with IT for lecturer professional development have been investigated: 1) the toolkit building blocks for effective lecturer professional development, and 2) six field labs: digital peer feedback, blended education, learning analytics, digital formative assessment, open educational resources and artificial intelligence. The toolkit is intended for designing professional development activities yourself, while the field labs contain ready-made professional development activities that can be adapted to your own context. Initiating (planning the innovation) and implementing (using the innovation) are preconditions for wider use of the innovation and thus for possible effects on lecturer learning and educational quality.

Research questions

The aim of this study was to investigate how the toolkit and the field labs from the Lecturer Professional Development Zone have been initiated and implemented in the 16 higher education institutions and what factors may support or hinder this process. To this end, two research questions were formulated:

- 1. How far along are higher education institutions in initiating and implementing educational innovations with IT for lecturer professional development?
- 2. What factors support or hinder the initiation and implementation of educational innovations with IT for lecturer professional development?

To investigate this, a semi-structured interview protocol was developed. A total of 38 participants were interviewed online, of whom 21 were (ultimately) responsible for lecturer professional development at each participating higher education institution (e.g., head of a Center for Teaching and Learning) and 17 were zone representatives for their institution, functioning as knowledge brokers.

How far along are higher education institutions in initiating and implementing educational innovations with IT for lecturer professional development?

The innovation-process model described by Rogers¹ was used to study the initiation and implementation of educational innovations. His model goes from initiation to implementation, with a critical decision moment in- between on whether or not to adopt the innovation.

Figure 1 shows the innovation-process model, with the criteria for each stage. Based on these criteria, the 16 participating educational institutions were assigned to the different stages. The results showed that the initiation and implementation of the educational innovations varied across the institutions: there were one or more higher education institutions in each stage. Most institutions (a total of seven), were in stage 3.

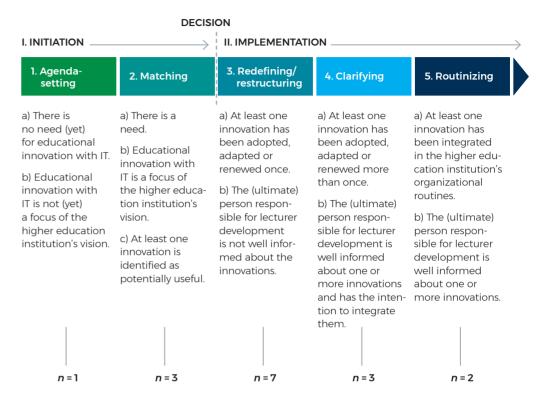


Figure 1 Number of Higher Education Institutions per Stage of Rogers's Innovation-process Model

The first stage, agenda-setting, consists of identifying and prioritizing problems that create a need for innovation. Higher education institution A (HEI-A) was assigned to this stage because there was a change of management and a quality trajectory aimed at improving the programs of study. This resulted in an unclear vision on educational innovation and having other priorities.

In the second stage, *matching*, a suitable innovation is linked to the problems or needs, resulting in a decision as to whether or not to further implement this innovation. Three higher education institutions were placed in this second stage, because they found one or more innovations potentially useful for their needs, but had not (yet) used them. An HEI-B participant said: "We are now considering how the Acceleration Plan could help with our need. More concretely, I discussed with my colleague how we can embed the toolkit in our basic qualification for didactic competence." Future use of the toolkit was also planned in

HEI-D, but no match was found for the field labs: "It did not seem we would benefit much from the field labs, as we felt we were already further ahead in that area."

In stage 3, refining or restructuring occurs, meaning that the innovation is adapted to the context. The seven higher education institutions in stage 3 had used one or more innovations once. For example, the Digital Peer Feedback field lab was implemented in its original form in HEI-K with eight lecturers from five different programs of study. The Blended Education field lab was deployed in its original form in HEI-J. Some other higher education institutions adapted the innovations to their own local context. A participant from HEI-E modified the toolkit, and explained: "We structured the building blocks differently. We wanted to have fewer of them, so we now use some of the building blocks in intake interviews to design professional development processes."

Stage 4, clarifying, occurs when the innovation is more widely adopted in an organization and takes on a clearer meaning. The three higher education institutions in stage 4 used at least one innovation several times and expressed the intention to integrate the innovation(s) into their organizational routines. At HEI-M, for example, the Blended Education field lab had been adapted into a blended boot camp and it was the intention to do this annually during the summer period. Furthermore, the participants who were (ultimately) responsible for lecturer professional development at the higher education institutions were well-informed about the innovations in stage 4, and they intended to integrate the implementation into the organizational routines.

Stage 5, routinizing, means that core elements of the innovation have been incorporated into the regular activities of the organization and the innovation has lost its own identity. At HEI-O, this was the case for the toolkit and the Blended Education field lab, the latter of which had become a formalized part of the basic qualification of didactic competence. Both innovations had also been integrated in HEI-P, which resulted in a change of thinking: "The movement that has started is very large and has had a real effect at all levels in the higher education institution, from students and lecturers to administrators."

What factors support or hinder the initiation and implementation of educational innovations with IT for lecturer professional development?

Various factors can support or hinder the innovation process. Based on the literature, these factors can be divided into four categories (Figure 2): 1) the (perception of the) relevant innovation, 2) the development of the innovation, 3) the individual, and 4) the educational institution as a whole³⁻⁷. Results of this study showed that the last three categories mentioned (development of the innovation, individual, educational institution) are significantly related to the stages. This means that the more advanced an HEI was in the stages of the innovation process, the more supportive factors related to these categories were reported.



Figure 2 Overview of Supportive and Hindering Factors in the Initiation and Implementation of Educational Innovations with IT for Lecturer Professional Development Note. Factors mentioned by at least 50% of the participants are shown in bold.

Innovation

The first category concerns factors related to characteristics of the innovation and how people perceive the innovation.

Table 1 Percentage of Participants (*n* = 38) Mentioning Supportive (S) and/or Hindering (H) Factors Related to the Innovation

Factor	Description	Example	% Total	%s <u></u>	%H 😧	%sh ∷
Relative advantage 1,3-5,8-14	The degree to which an innovation is perceived as having added value.	"If certain themes are not relevant at that moment in your own institution, it will be very difficult to find support for this within your own organization and also to contribute to it."	81.6	15.8	31.6	34.2
Compatibility (with the local context)	The degree to which an innovation is perceived as consistent with or adaptable to current values and methods.	"It is very recognizable to us and that is why it fits well."	73.7	21.1	31.6	21.1
Usability 1,3,5,8,9,11,12	The degree to which the innovation is perceived as clear, concrete and practical to use.	"You can get started right away."	71.1	34.2	18.4	18.4
Evidence- informed approach	The degree to which both practical knowledge and knowledge obtained from research are used to mold the innovation.	"It is not just a bunch of tools like many other platforms, but there is also a lot of theory and vision behind it, plus the fact that research is being done."	42.1	39.5	0.0	2.6

Accessibility 5,9	The degree to which the innovation is perceived as easy to access.	"The website is clear [] and you can easily download the innovations, so people can easily access them."	34.2	28.9	2.6	2.6
Triability ^{1,3,5}	The degree to which the innovation can be experimented with on a limited scale.	"Trying something small is always more pleasant to do than having to use something very big right away."	26.3	23.7	2.6	0.0
Design (generated from data)	The degree to which the design of the innovation is perceived as beautiful.	"I think all the innova- tions look great and that really helps."	18.4	15.8	2.6	0.0
Opportuni- ty to reflect ⁵	The degree to which the innovation allows for reflection.	"With the toolkit you can get a lot of insight into: what are we doing now, what works and what does not work?"	15.8	15.8	0.0	0.0
Costs ³	The degree to which money is required to get or use the innovation.	"I think there is also an online version and I got it sent home. It was also free, so that is a plus."	5.3	5.3	0.0	0.0
Observabil- ity ^{1,3,5,13}	The degree to which the results of the innovation are visible to others.	"It is necessary to see how it works elsewhere as well as to show others that it works here too, so that it convinces people."	5.3	0.0	5.3	0.0
Primary process ⁵	The degree to which the innovation is focused on the primary learning process versus on the institution.	(none)	0.0	0.0	0.0	0.0

Development of the innovation

The second category concerns factors related to the process of developing and implementing the innovation.

Table 2 Percentage of Participants (n = 38) Mentioning Supportive (S) and/or Hindering (H) Factors Related to the Development of the Innovation

Factor	Description	Example	% Total	%s	%H 😧	%SH ⊕
Knowledge broker ^{1,5,15}	The degree to which zone representatives disseminate the innovation, using several/various dissemination channels and connecting to existing processes.	"He is the linking pin who looks at things that happen in the Acceleration Plan and then brings in what is relevant. People are busy with so many things and do not have time to look at everything and explore it in depth."	94.7	50.0	7.9	36.8
Nationwide versus local ^{5,16}	The extent to which it is perceived as valuable that the innovation was developed in a collaborative effort at the national level.	"We could never have generated such an enormous amount of knowledge by ourselves."	57.9	21.1	34.2	2.6
Involvement of staff ^{1,5,9,10,14}	The degree to which lecturers and other staff were involved in the development and adoption of the innovation.	"It would have helped if more people, for example, three or four people from my team, were involved or if the composition of zone representatives had varied from year to year."	55.3	34.2	10.5	10.5

Knowledge broker

Table 3 lists factors related to specific characteristics of the knowledge broker. Knowledge brokers share knowledge about the innovation with others in the institution, resulting in dissemination throughout the institution¹⁷. In the case of the Acceleration Plan, the zone representatives fulfill the role of knowledge broker. They make the link between the national innovation and their local educational context.

Table 3 Percentage of Participants (*n* = 38) Mentioning Supportive (S) and/or Hindering (H) Factors Related to the Knowledge Broker

Factor	Description	Example	% Total	%s	%H 😧	%SH ∷
Position in the higher education institution ^{1,3,9}	The formal and informal position of the knowledge broker.	"I am a project manager, so I am in charge of using in- novations tomorrow if I want, and I can also direct people to use the innovations."	52.6	18.4	13.2	21.1
Time and priority (generated from data)	The degree to which the knowledge broker experienced having enough time and prioritized dissemination.	"The amount of time I have, also for this role, is not quite enough for my ambition."	44.7	18.4	18.4	7.9
Involvement of the knowl- edge broker (generated from data)	The degree to which the knowledge broker was involved in the zone and the development of the innovation.	"We contributed to the development of the toolkit, so it would not make sense not to use it."	42.1	15.8	15.8	10.5
Interpersonal skills ^{1,9}	The degree to which the knowledge broker is able to exchange in- formation in an effective way.	"Throughout the years, I improved myself in connecting with what is relevant to someone else and seeing the benefit for this one person."	23.7	13.2	2.6	7.9

Factor	Description	Example	% Total	%s	%H	%SH ∷
Self-efficacy ⁹	The degree to which knowledge brokers believe in their own abilities to disseminate the innovation.	"I am someone who thinks: I have never done it, but I will do it anyway. Usually it works out."	23.7	18.4	5.3	0.0
Experience (generated from data)	The amount of experience the knowledge broker has in education and in this higher education institution.	"I have been working within our institution for a long time and have held various positions, so I know what is going on."	15.8	13.2	2.6	0.0
Personal benefits ^{3,9}	The degree to which the knowledge broker has status, rewards or other benefits from dissemination.	"It is of course very nice that people view the Accelera- tion Plan positively and that you are part of it. In any case, it gets attention and attention is always nice."	10.5	7.9	2.6	0.0
Perceived relative advantage ^{9,18}	The degree to which the knowledge broker perceives the innovation as having added value.	"Some of the innova- tions are very close to my own research, which of course also makes me even more enthusiastic about them."	10.5	7.9	2.6	0.0

Individual

The third category concerns factors relating to individual characteristics of lecturers and other staff at the higher education institution.

Table 4 Percentage of Participants (*n* = 38) Mentioning Supportive (S) and/or Hindering (H) Factors Related to the Individual

Factor	Description	Example	% Total	%s	%Н Э	%SH
Motivation 4,5,9,13	The degree to which the individual wants to use the innovations to renew education with IT. This also includes the not-invented-here syndrome.	"People just start with themselves: to what extent do I want to use what someone else has made or do I just want to do it myself?"	76.3	34.2	21.1	21.1
IT literacy 4.9.12-14	The ability to make informed and reasoned decisions on using existing technologies that improve teaching and learning.	"Some do not really know what is possible or what resources are available or it is just not their cup of tea, so they have fewer questions about it, search less and do not know where to go to"	42.1	7.9	23.7	10.5
Beliefs ⁴	Individual beliefs about what constitutes good teaching, how students learn, and the role and added value of IT.	"They believe that the very best form of education is one-on-one education and anything that deviates from that is a weakened form. They are also not inclined to use these types of innovations."	39.5	23.7	5.3	10.5

Factor	Description	Example	% Total	%s ©	%Н Э	%SH
Self- efficacy ^{8,11}	The degree to which individuals believe in their own abilities to implement educational innovation with IT in practice.	"In normal class, people feel competent to improvise, while when IT is not working, they feel less competent: is IT going to do what I want it to do and if it does not work, do I have the knowledge and skills to adapt?"	28.9	10.5	13.2	5.3
Perceived autonomy ^{4,5}	The ability and capacity that individuals perceive themselves to have in the decision-making processes within their department and higher education institution.	"People have questions: when do I plug it in, when do I push it through, when do I insist that we really have to do this and when do I move with the faculty?"	7.9	5.3	2.6	0.0

Institution

The fifth category concerns factors relating to the characteristics of the higher education institution in which the innovation takes place.

Table 5 Percentage of Participants (*n* = 38) Mentioning Supportive (S) and/or Hindering (H) Factors Related to the Educational Institution

			%	%s	%Н	%SH
Factor	Description	Example	Total	\odot	\odot	\odot
Facilitation of implementation of the innovation by providing time and financial resources 3.5.9,14,18,19	The degree of available time, (perceived) workload and financial resources for the use of the innovation.	"My plea to manage- ment is always: make sure people get time and space, only then will it happen, because technology simply takes time."	92.1	7.9	63.2	21.1
Leadership 3-5,8-10,13,19	The degree to which formal leaders encourage, support and prioritize the adoption of the innovation.	"I think it is important that management, such as an education quality manager, is also informed and proactively talks about the innovations and encourages employees to get started."	84.2	21.1	36.8	26.3
Knowl- edge infra- structure 3-5,13,14	The degree to which the units in the higher education institution are linked by inter- personal networks.	"A network is different from people who know each other. There are a lot of people who know each other, but within a network we are really sharing knowledge."	73.7	34.2	21.1	18.4

17

Factor	Description	Example	% Total	%s	%H 😧	%SH ⊡
Climate of read- iness for change ¹⁶	The degree to which the institution is inclined to accept, embrace and adopt the innovation to purposefully alter the status quo. This factor also includes: reorganizations and the COVID-19 pandemic.	"We are in transition to all kinds of new IT systems. That will soon take up our time, so that these kinds of things will receive less attention."	52.6	10.5	34.2	7.9
Vision and ambition 4,5,13,14,18	The degree to which vision and ambitions are clear regarding educational innovation for lecturer professional development with IT.	"The direction it is heading and what that requires of you as a lecturer is still too unclear for us. That works as a kind of brake."	50.0	18.4	18.4	13.2
Staff turnover ^{3,5}	The degree of staff turnover, changes in functions and layoffs.	"We have had new training managers for a year now, so in that sense it just really came at the wrong time."	50.0	2.6	39.5	7.9
Size of the higher education institu- tion ^{3,5}	The degree to which the higher education institution is perceived as large or small.	"An entire university of applied sciences is large, which makes it quite difficult to get something off the ground." / "We are a small university of applied sciences with limited capacity."	50.0	5.3	34.2	10.5

			%	%s €	%н (:)	%sн ⊡
Factor	Description	Example	Total		0	
(De)centralized position Center for Teaching and Learning ¹⁴	The way in which lecturer professional development is organized.	Centralized: "In our institution, too much is directed from above: this is how we are going to do it and then it will be fine. No, you have to respond to the questions and needs of lecturers, knowing what is going on and what can help them."				
		Decentralized: "In our institution, everyone is reinventing the wheel, not know- ing where to find the information and what is already there."	47.4	13.2	31.6	2.6
External expecta- tions ^{3,5,13,16}	The degree to which external stakeholders, such as the Acceleration Plan or the professional field, set expectations and provide support.	"It is very non-binding, you can use it if you want, but you do not have to."	44.7	26.3	15.8	2.6
Autonomy of faculties 3,18	The degree to which faculties are independent to make their own decisions.	"Faculties mainly determine their own agenda. You can influ- ence that, but you cannot decide on it."	42.1	0.0	31.6	10.5
IT infra- structure 4.8.9.12,14,16,18	The degree to which facilities, learning resources and support are available that are necessary to integrate IT into education and the associated professional development.	"If I want to do something with learn- ing analytics, but all the systems I have do not store data, then I cannot do anything."	36.8	15.8	18.4	2.6

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			%	%s	%H	%SH
Factor	Description	Example	Total	$\overline{\mathbb{Q}}$	\Box	
Learning culture ³⁻⁵	The degree to which the institution has a professional atmosphere, beliefs, perceptions, responsibilities, relationships and objectives, focused on the ongoing development of lecturers.	"People are sometimes stuck in how they do things for a long time and then suddenly things change."	21.1	2.6	18.4	0.0
Formaliza- tion ^{3,4}	The degree to which the institution emphasizes compliance with rules and procedures among its members.	"There are rules and procedures, but the content is very often unclear. You are sent from pillar to post and do not know what to do."	21.1	2.6	18.4	0.0
Profession- alization opportuni- ties 4,5,8,14,18	The professional development opportunities in the field of IT available to lecturers within the higher education institution, such as courses, training and professional learning communities.	"If you want something: shout it and it is possible."	15.8	13.2	0.0	2.6
Prioritizing educa- tion ^{3,4}	The degree to which the higher education institution prioritizes education (versus research).	(none)	0.0	0.0	0.0	0.0

Conclusions

The higher education institutions were in different stages of Rogers's innovation-process model and thus varied in how far they were in initiating and implementing educational innovations with IT for lecturer professional development. Possible explanations for stage differences can be found in the development of the innovation, the individuals, and certain characteristics of the educational institution.

The three most frequently mentioned supportive factors are:

- The role of the knowledge broker.
- (Perceived) relative advantage of the innovation itself.
- Motivation of lecturers and other staff.

The three most frequently mentioned hindering factors are:

- · Facilitation of implementation of the innovation by providing time and financial resources.
- · Leadership.
- (Perceived) relative advantage of the innovation itself.

These factors, as well as others described in the overview, are important to take into account for successful innovation. For example, it is preferable to choose multiple knowledge brokers with a large network who occupy a relevant informal and formal position for making connections. In particular, dissemination channels that specifically address people, such as small talks, workshops and webinars, seem to have more reach than, for example, newsletters. In addition, it is useful to create win-win situations. Linking the innovation to existing processes, to a problem or to something that many people are already working on enables people to see the added value of the innovation more quickly, and you save time and money. Finally, do not forget to involve leaders, lecturers and other staff in the development of the innovation. Make people co-owners and ensure strong support. This maximizes the chance of successful innovation!

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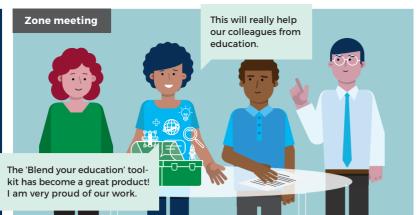
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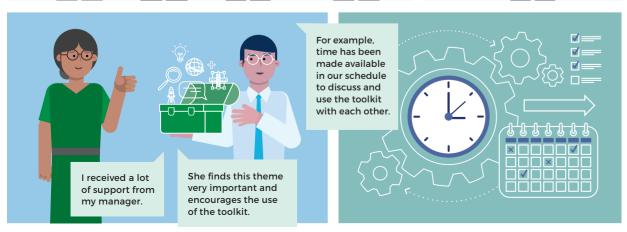






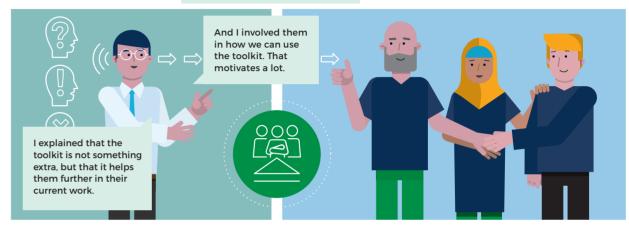
















The end





Educational innovation using information technology (IT) has been a priority in higher education for many years, due to its impact on the quality and accessibility of higher education. However, successful initiation and implementation of innovations in this area is not a given. Educational innovations often get stuck or even cease to exist.

The Lecturer Professional Development Zone of the Acceleration Plan for Educational Innovation with IT has therefore investigated how their nationally developed innovations have been received at its 16 participating higher education institutions. The researchers describe the current state of affairs and what factors play a role in the innovation process, from initiation to becoming an organizational routine. Learn how to innovate from our lessons learned!



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