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Changing paradigms: moving higher education into the 21st century

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Author: Zarina Charlesworth.

Abstract

Institutes of higher education can no longer pretend that the Fourth Industrial Revolution will not impact the way that learning is viewed, and education delivered. This article looks at changes in education from the perspective of students, educators, administrators complemented by practitioner action research in the classroom. In answer to the question of how to induce 21st century change in higher education, a meta-interpretation (Weed, 2005) of six related research studies carried out over the period 2014–2017 was conducted. This in turn has allowed for a comprehensive analysis and the identification of key change-related findings that cut across the afore-

mentioned stakeholder groups. A framework for change is put forth for administrators and examples for innovative classroom practice are provided for educators.

Introduction

It is clear that what is frequently described as the Fourth Industrial Revolution (Schwab, 2016) is having an impact not only in more traditional industries but in education as well. In 2012, digital technology was identified as one of the five key drivers of change taking place in education with one report going so far as to say “Campuses will remain, but digital technologies will transform the way education is delivered and accessed, and the way value is created by higher education providers, public and private alike” (Ernest & Young, 2012, p. 4). Three years later it was said that “the impact of technology on education delivery remains sub-optimal [...and contributions] to teaching and learning have yet to be fully realised and exploited” yet, “it is vital that teachers become active agents for change” (OECD, 2015, p. 4). Educators today are faced with a world in mutation and it behoves us to tailor the learning experience so as to provide our higher education students with the competencies and knowledge that they will need as they move into the work force. As much as this is an exciting time, change can also be difficult and confusing, sometimes missing the overview necessary to move ahead and in turn often lacking coordination. A transition, first mentioned by King from “sage on the stage” to “guide on the side” (1993), is clearly underway, however, the opportunities afforded by technology add a level of complexity to the educational reality that has not yet sufficiently been taken into account (Jörg, Davis, & Nickmans, 2007; Reigeluth, Beatty, & Myers, 2017). The ongoing change in practices “will mean that more emphasis is placed on the teaching processes being situated as active ‘co-learning’ experiences [and that the] adoption of a more scholarly and reflective approach to teaching practice is clearly a logical strategy to help achieve this shift (Conole & Alevizou, 2010, p. 21).

The vision of the future of education held by those involved in the studies referred to is one full of hope and enthusiasm as we enter an age of unlimited possibilities where learning starts at an early age and goes on throughout one’s life. It is an exciting time, but we have a long way to go. The use of technology certainly does, however, afford educators, the possibility to add value to the learning experience (Ertmer & Ottenbreit-Leftwich, 2013; Howland, Jonassen, & Marra, 2012; Jonassen, 1996). Surprisingly, and despite all the resources available to educators, there has been relatively limited change in course delivery in higher education. What are the barriers and drivers to this paradigm change? Perhaps a better understanding of these issues will allow us to move

forward with conviction and enthusiasm into a 21st century that is already well under way allowing the higher education community to become proactive in the shaping of the Fourth Industrial Revolution (Abu Mezied, 2016).

This article examines the nature of change in education through a meta-interpretation of a series of selected studies taken from two practice-based action research projects (2014–2016 & 2016–2017) carried out at the University of Applied Sciences and Arts of Western Switzerland. The reason for this type of interpretation being to provide the whole picture as we are looking at a paradigm change and not just a snapshot of innovative classroom practice. A paradigm change does not necessarily mean starting completely afresh, however. The research presented here is firmly anchored in existing theory, which provides the guiding thread linking all the studies in this meta-interpretation together and shows how one can move from the past into the future without having to make any kind of break.

The paper closes with the key findings of this analysis and a discussion of how to meet some of the challenges faced. Examples, based on the action research, are provided for the easy integration of technology in the classroom that may be of interest to educators. The conclusions drawn here are based on and aimed primarily at higher education providers but may be applied in general.

Theoretical background

Self-regulation

The research referred to in this article draws on two main bodies of literature to link together the series of studies referred to in this meta-interpretation. The point of departure and the pivot for all the studies conducted was the concept of self-regulation. In Zimmerman's (1989) words, "self-regulated learning strategies are actions and processes directed at acquiring information or skill that involves agency, purpose, and instrumentality perceptions by learners" (p. 329). This process, first introduced by Bandura (1986, 1991), is seen to be subject to the impact of personal, environmental and behavioural influences. These influences may vary in strength depending on the learning situation. For example, a group project conducted across countries with different time zones may be subject more to environmental influences than would a project conducted at a local level. Today the environmental influence is of particular importance as it relates not only to the physical environment but to the virtual as well.

The idea of self-regulation was later taken up by Nicol and MacFarlane-Dick who see it as “manifested in the active monitoring and regulation of a number of different learning processes: e.g. the setting of, and orientation towards, learning goals; the strategies used to achieve goals; the management of resources; the effort exerted; reactions to external feedback; the products produced.” (2006, p. 199). Adding to this, the work of other researchers (Pintrich, 2004; Winters, Greene, & Costich, 2008; Zumbrunn, Tadlock, & Roberts, 2011) emphasizes the role of directed learning through its active construction and purposeful engagement. The management of learning thus takes on new proportions which in turn rely more than ever on the development of self-regulation processes.

In today’s ‘educational ecosystem’ (Cristol, 2014) higher education students are faced with an unprecedented amount of information, a need to sift through, select and share it as well as use it to further their knowledge. Zimmerman saw the process of self-regulation as going through three phases (Zimmerman, 2000). This was later taken up by Dabbagh and Kitsantas and then revisited by Charlesworth & Sarrasin taking technological advances into account. Table 1 presents a comparison of these frameworks (Charlesworth & Sarrasin, 2014).

Table 1. A Comparison of Frameworks.

	Zimmerman (2000)	Dabbagh and Kitsantas (2012)	Charlesworth and Sarrasin (2014)
	Phase	Stage	Level
1	Forethought	Personal information management	Organization and searching
2	Performance or volitional control	Social interaction and collaboration	Information exchange
3	Self-reflection	Information aggregation and management	Co-creation and co-construction of knowledge

The link between the levels shown in Table 1 and the competencies that higher education is called upon to develop in 21st century graduates, including those of critical-thinking, creativity, communication, and collaboration, (World_Economic_Forum, 2015) is clear.

Organization and searching skills can be linked to both the organization of study as well as to information literacy. Higher education students today need support in the search for information and especially in the validation of what information is reliable, a role both the institute as well as its educators need to fill. In terms of information exchange students are generally quite capable yet often default to more basic types of exchange through the institute's learning management platform (LMS), Dropbox, WhatsApp, etc. But when called upon to go past simple exchange and delve into the co-creation and co-construction of knowledge which technology easily allows one to do "few students naturally do this well" (Zumbrunn et al., 2011, p. 4). These skills and competencies rely heavily on collaboration. Related literature that has taken this up (De Corte, 2012; Järvelä, Näykki, Laru, & Luokkanen, 2007; Lee & Tsai, 2011; Leinonen, Järvelä, & Häkkinen, 2005; Li, Ingram-El Helou, & Gillet, 2012), suggests that educators giving support for individual learning through the use of structured collaboration will encourage students to develop strategies that allow for the co-creation and co-construction of knowledge.

Change Management

Clearly the onus for learning is increasingly on the students themselves and in each of the afore-mentioned levels they are expected to perform. It is in the third level, however, that the idea of a paradigm change comes to fruition as it is here that the educator has a large role to play. A role which goes far past just adapting one's course syllabus but calls into question what learning in the 21st century really is and calls on the educator to examine his/her educational practice. This in turn leads us to the idea of change. To better understand the mechanisms of change, the second body of literature referred to in this article is that of change management (Kotter, 1995; Lewin, 1958; Quinn, Amer, & Lonie, 2012). The foundations for organizational change were embraced by management / industry some twenty years ago. These have since been taken up in education with a framework put forth by Quinn et al. (2012). This framework is shown in order that conclusions can be drawn not just about what changes might be pertinent but how to have such change embraced by educators.

There is little published research on change management in higher education that looks at the principal stakeholders: students and educators. Faculty developers as change agents have been looked at (Dawson, Mighty, & Britnell, 2010) as have academic support centres (Diamond, 2005). "Unfortunately, much of what is at the disposition of the educators comes from instructional designers and support personal whose time in

the classroom is often limited and may be overly “tool” oriented” (Charlesworth & Sarrasin, 2017a, p. 7376). As pointed out by Kirkwood & Price (2013) educator’s questions are often concerned with the use of a particular tool or technology rather than with the more creative “*How can I enable my students to achieve the desired or necessary learning outcomes?*” or “*What forms of participation or practice are enabled for learning?*” (p. 332). The question remains of how to engender this kind of change.

Using Lewin (1958) as the starting point with his three-step: unfreezing, moving, refreezing description of organisational change, together with Kotter’s 8-step model (1995), Quinn et al. (2012) came up with three related phases for driving change in education as shown below:

Phase 1: *Setting the stage* in order to “break open the shell of complacency” (Lewin, 1958, p. 211) through actions which encourage change.

Phase 2: *Making change happen* means allowing change to happen through “empowering of others to act on the vision through encouraging risk-taking, and non-traditional ideas, activities, and actions” (Kotter, 1995, p. 3).

Phase 3: *Making it stick* where actions involving systems and structures emphasize the commitment of the institute.

Clearly the relationship between evolving student needs and managing change at the level of the institute is complex. The question that this paper looks to answer is, how, taking the various stakeholders and their perspectives into account, can one hope to drive change.

Methodological orientation & procedures

Rather than present research findings from one or more isolated studies, this article provides a meta-interpretation (Weed, 2005) of related research studies conducted over the period 2014–2017. What is proposed here is to synthesize the results of these studies in order to look at how best to move change forward in higher education and this at levels from the student through to the administration.

The synthesis of research, both quantitative and qualitative, has taken on increasing importance over the past twenty years. Going from a focus on the synthesis of

quantitative studies, frequently through the use of a meta-analysis, the methodological literature now describes any number of ways for synthesizing all data types. There seems to be some consensus that despite the variety of methods referred to, there should always be an element of structured synthesis. A distinction can, however, be made based on “the extent to which the various methods aim to test, explore, or generate theories and the extent to which they interpret evidence from the included studies” (Snilstveit et al. 2012, p. 414).

It is of importance to note that “the re-interpretation of original research is not a valid way to proceed” (Weed, 2005, paragraph 36). Where more traditional research synthesis and review tended to rely on a summary of findings, the narrative approach to synthesis aims to generate new insight allowing for a more holistic approach. The approach taken in this paper is that of Secondary Analysis of Primary Data as defined by Weed (2005) where the original interpretations are considered to be the raw data for the secondary analysis.

As mentioned by Weed (2005), and in the tradition of qualitative research, the terms validity and reliability are not appropriate in this type of analysis. This is not, however, to refute their importance but to redefine them accordingly. In the case of this current work, ‘research quality’ the term used by Weed (2005) and seen as “referring to ensuring the quality and integrity of the meta-interpretation approach” (paragraph 37) is particularly well suited. Guaranteeing this quality calls for a selection of the studies to be included and for transparent nature of the process where all studies referred to are available for the reader to access.

The six studies referred to in this analysis were carried out between 2014 and 2017 and called on a range of methods including: the use of student focus groups (2 having n=17 participants); faculty interviews (n=5; n= 16); administrator interviews (n=9); faculty workshops (20 having n=252 participants) with a follow-up questionnaire (n=39); and finally two revised courses (BA students and Continuing Education students) which each went through three action research iterations as well as allowing for a quantitative component (BA students n=85) and a virtual community analysis (Continuing Education students n=95).

The choice of these six studies was dictated by the fact that they were all part of two related research projects carried out in the same university allowing a coherent and holistic approach to the issue.

As suggested by Weed (2005 paragraph 43), this type of interpretation calls for:

- A focus on *meaning in context*;
- Interpretations are the raw data for synthesis;
- An iterative approach to the sampling of studies for synthesis.

This approach allows for a more comprehensive approach to the findings. Accordingly, the selected studies have, in the first instance, been grouped by context before proceeding to the final analysis.

Results

The interpretations for each of the studies included in the meta-interpretation are considered to be the raw data or the “primary subject for secondary analysis” (Weed, 2005, paragraph 35). A total of six studies have been included in this analysis. A compilation of the original interpretations is shown below in Table 2. Once again, the object is not to reinterpret neither to summarize but to provide, through further analysis, an interpretation that goes beyond that of each individual study, rather like making a collage of photos and as the whole picture emerges being able to see something new.

Table 2. Compiled Studies 2014–2017: Reported findings.

Focus	Study	Sample	n=	Methods	Reported findings	Related publications
STUDENTS	#1	BA students	n= 17	Qualitative Focus groups (2) Filmed / transcribed/ coded	Internet seen as an alternative to class / teachers expected to add something to the equation Students still holding traditional views on education yet would appreciate being involved in change Students might be digital native but are not digital learners No strong opinions about differences between traditional versus Web-based instruction Teachers expected to adapt “stop throwing information at us”; “stop reading slides”	(Charlesworth & Sarrasin, 2014)
	#2	BA students	n = 85	Quantitative self-report questionnaire based on Lee & Tsai (2011)	Levels (1) Organization & searching = well in hand (OS) (2) Information & exchange = high level but often course documents or social arrangements (IE) (3) Co-creation & co-construction = little activity (CoC)	(Charlesworth, 2015; Charlesworth & Sarrasin, 2014, 2015a)

	#5	Continuing Education students	n = 95	Qualitative Virtual community Text analysis	resistance towards the use of a virtual community Asynchronous natures of the community worked positively Moved from 'likes' to 'co-creation' with additional instruction & a specific rubric	(Charlesworth, 2017)
COURSE DESIGN	#3	BA students + Continuing Education students	2 courses	Action research 3 iterations per course	Students felt as if they had lost control Teacher was expected to be more than just a coach and to provide feedback and interpretation – if possible in written form OS/IE/CoC found effective for course organization but skill set value was not clear for the students Synthesis, feedback and presentation skills all saw development	(Charlesworth, 2016a; Charlesworth & Sarrasin, 2015b)
ADMINISTRATION	#4	School administrators + pedagogical advisors	n = 9	Qualitative semi-structured interviews transcribed & coded	Administration needs to drive change more convincingly A lack of coherence seen across the 3 stakeholder groups in terms of expectations Lack of communication in all directions Infrastructure is sufficient at this time with support for teacher development, projects, etc...	(Charlesworth, 2016b)
FACULTY	#1, #4	Faculty	n = 5 n = 16	Qualitative semi-structured interviews transcribed & coded	Technology leads to a classroom that is more motivating and dynamic Technology had impacted the amount and manner in which they included theory in their course delivery. Changing role of the educator from teacher to coach unclear at times A need to implicate students Adding-value to the learning experience by being there to put things into context The range of tools remains extremely limited with a tendency to default back to the institutional tools such as the LMS and email – often a time issue The use of video & quiz tools often linked to student expectations and, at times, a rather desperate attempt to keep their attention. A loss of communication, less body language, eye-contact, facial expressions A change in the 'personal space' of both students and educators seen as difficult Positive involvement of the student in the learning process Encourages collaborative learning and networking beyond the classroom Can add diversity and allow for the inclusion of various activities in class	(Charlesworth & Murphy, 2016; Charlesworth, Sarrasin, & Murphy, 2016)
					"setting the stage" impetus came from the University administration. "guiding coalition" two faculty members with a project on	(Charlesworth

				Action research in Interactive Workshops (n=20)	pedagogical innovation “making change happen” stage saw the development of interactive workshops “making it stick” stage is still ongoing	& Sarrasin, 2017a)
#6	Faculty	n = 252				
					Low level of digital fluency among educators having an interest in technology integration Interactive workshops as a mechanism for change based on questionnaire mitigated with positive (59-79%) responses on increased understanding and tool testing but equally split between follow-up use in the classroom Desire for additional workshops as well as online support (despite non-use of the virtual space created or the docs available in the LMS!!!) as well as personal coaching	(Charlesworth & Sarrasin, 2017b)
#6	Faculty	n = 39		Self-report questionnaire		

Changing paradigms, largely due to digitalization, are going on all around us. Whether educators are inclined to go the route of technology enhanced learning becomes a moot point because technology, whether in the classroom or not, is now ubiquitous. Its impact has been to change the teacher-student dynamic, to alter the time-distance relationship and to give students unlimited access to all the knowledge they could desire, calling on educators to add real value or be shunned by their students. All of the research presented here has been subject to a meta-interpretation highlighting barriers and drivers to this paradigm change.

The findings reported in Table 2 confirm the impact of technology on course delivery today. Even though innovation in the classroom does not necessarily call for the use of technology it clearly needs to be considered in any course redesign.

Table 3 is a recompilation of the findings shown in Table 2 by stakeholder group and divided into barriers and drivers to classroom innovation.

Table 3. Barriers & Drivers to innovation in the higher education classroom.

Stakeholder group	Barriers	Drivers
Students	Digital native ≠ Digital learner Feeling a loss of control in a non-traditional classroom Resistance to change	Expecting teachers to add value Asynchronous time-distance relationship seen as positive Appreciate being involved in the learning process
Faculty	Unclear on changing role of educator Relatively low level of digital fluency Insufficient time available to embrace change	Use of technology is motivating & created a dynamic classroom Clear benefits for collaboration & networking beyond the classroom with student involvement
Admin	A number of campuses over a large distance Insufficient communication from the top down Overall vision not clear to educators	A teacher training department A certain level of support for innovation-related projects Support for conferences

Going past just a synthesis by category of stakeholder but to a cross-stakeholder synthesis it becomes clear that there are interacting relationships worth highlighting, allowing us to identify key findings. Key findings risk remaining just that if measures are not taken in response to them. At the end of the day, what is shown in these studies is that there is uncertainty, confusion, resistance, and a certain passivism on the part of both students and teachers. To move this forward, the administrators have a certain responsibility and through the principles of change management, as experienced and described previously, there is a clear path to follow. Here we turn to Quinn et al.'s (2012) framework for change suggesting that the findings be addressed in a manner so as to make the most impact.

Setting the stage – where complacency is no longer accepted

Key finding #1: Both students and educators are novices in the use of technology for learning

For example, students, despite their digital native status do not really know how to use technology for learning. Many educators get put off by the idea of digital natives, worried that they might not be able to keep up. What they do not realize is that

although students are often tech-savvy they are no further up the learning curve than the educators themselves in terms of how best to use technology in the classroom. This translates into an excellent opportunity for educator-student collaboration and even co-creation as they discover together what can be done. If educators are encouraged to take on this challenge without fear of recrimination or the possible consequences of negative student evaluations the stage will be set to go further.

Key finding #2: Innovation-related projects and conferences call for more than lip service

Clearly the instauration of innovation-related projects and conferences is a good start, yet it is not sufficient for the institute to applaud these events rather real involvement, time allocation for those involved, publicity for the outcomes and follow-up could make much more of an impact.

Making change happen – giving substance to vision

Key finding #3: A need to close the gap between institutional vision and what is happening on the ground

Clearly there is a gap between what those in administration see as the vision for the future of the institute and what is communicated, or not, to the educators. A real effort is called for to close the gaps in perception of where to next.

Key finding #4: There is a real need for scaffolding and institutional support

The need for scaffolding in their own learning on the part of the educators involved is not to be underestimated. Educators are being pulled in many directions with often more than just teaching commitments. It is insufficient to tell educators that they have permission to go ahead and make changes without providing the required support. Support that should go beyond the possibility of seeing a pedagogical advisor or taking a course but support that brings together discipline champions with those searching for new solutions and gives educators the time and space needed to experiment.

Making it stick – where systems and structures are impacted

Key finding #5: Sufficient time for change in course delivery is lacking

Telling educators that they have the liberty to run their courses as they see fit and to say that innovation is encouraged but unfortunately this does not merit an additional time allowance simply does not give the right message. Encouragement needs to go as far as allowing time and space for the creativity that will be needed as education evolves.

Key finding #6: The need for a centralized resource centre

It is one thing to give educators the go ahead to change their methods of course delivery and encourage instructional diversity but if the infrastructure does not evolve hand-in-hand with technology this cannot work. The new generation classroom calls for tables and chairs that are easily reconfigured, ideally several beamers, movable white boards, wireless access, and sufficient sockets to plug electronic equipment into. The standard classroom setting with tables cabled together will not work.

New ideas and innovative solutions will not suffice to change the face of education and the still dominant paradigms of teaching and learning but a more strategic and integrated approach such as shown above is called for in order that lasting change takes place.

Discussion and conclusions

A meta-interpretation of the results suggests that there are many sides to this story and that research often informs on only one aspect. In some cases, this is sufficient but in the case of fundamental changes, such as we are now seeing in the educational paradigm, this will not suffice. Jasinski (2007) speaks of inter-related enablers, some of which have also shown up in our research and which include “a work culture that embraces and supports innovation; a robust technology infrastructure; technology tools that are appropriate for teaching and learning purposes; a senior champion who drives the process; a willingness to consult and share; and supportive managers, peers and support professionals” (pp. 4–5). These are all important elements, but our research supports the idea that for educators to embrace change there are other even more important elements including: time allowed, valorisation of effort, support and recognition from all levels and encouragement. Unfortunately, administrators tend to default to Industrial-Age mental models or mindsets (Reigeluth et al., 2017) and continue to evaluate education along well-known standard lines which often penalize the risk-taking educator who wants to try something new in the classroom. The key findings presented in the previous section provide clear direction in answer to the question posed at the outset of how to induce 21st century change in higher education. If nothing else, the action research experience has taught us not to be afraid of making mistakes and trying new things out in the classroom even if at first one does not succeed. Below are two examples of actions that were carried out successfully during the action research and to the enjoyment of educators and students alike.

Importance and relevance for practice

Example: The Learning Community

Type of tool

- A social networking platform such as Google+, Facebook groups, Facebook Workplace, Moodle forum, Slack, etc.

Pedagogical objective(s)

- Co-creation of knowledge through peer feedback.

Competency(ies) being developed

- Critical thinking, giving feedback, collaboration

Calls for the development of a community-specific grading rubric, a clear assignment for the students and, an explanation of what the co-creation of knowledge entails. For example, the posting of a subject-specific infographic for comments by those in the community prior to an in-class presentation for assessment. The manner in which the assignment is presented to the students is extremely important and can make the difference between failure and success.

Example: "Snapshot"

Type of tool

- Any tool that allows the creation of a poll that can be accessed on either a mobile device or a laptop.

Pedagogical objective(s)

- Provide a visual representation of the class understanding of a specific topic to assess whether further explanation is necessary or to provide material for discussion and allow students to move up the learning curve on their own.

Competency(ies) being developed

- Group dynamics

A poll that allows students to select one of, in most cases, up to four answers. Many of the poll tools are anonymous and show live display as the answers arrive. This provides a snapshot of understanding at a moment in time and can be used any time during the class; at the start and finish of a class to see if there has been a change in response; or as the start of a group discussion.

The importance of doing this type of meta-interpretation is that it allows one to see the big picture. As illustrated in the story of the blind men and the elephant (PeaceCorps, undated), the Jain-based theory of manifold predications states "to be competitive, innovative and successful we need the team to look at the larger picture collectively rather than get one view" (Sharma, 2011 paragraph 11). The suggestions put forth here should help move change in the educational paradigm, currently often only occurring at the individual educator level, to the collective school and community levels.

Author

Zarina Charlesworth, PhD (Ed.), University of Applied Arts & Sciences of Western Switzerland, HES-SO, Switzerland

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