

# Empowering Technology Acceptance Through the Added Value of Urgency: Teaching Profession Smart-Working Case

Christian Rainero\* - Giuseppe Modarelli†

**Summary:** 1. Introduction - 2. Methodology and gap identification - 3. Theory: the recursive process of humans' innovative creation - 4. Framing contexts and hermeneutical paradigms - 5. Intersecting innovation acceptance, urgency contexts and teaching profession smart working - 6. Results- 7. Conclusion - Appendix.

## Abstract

This research is based on the near future for pervasive technologies in social practices and work context, fixing its pillars on a controversial debate related to the innovation acceptance under the light of the 4<sup>th</sup> industrial revolution. The recent Covid-19 pandemic would shape the line of a new work environment, never experienced before with this wide spread: smart working. The authors would try to clarify at theoretical level the role of knowledge in innovation and evolution of civil society based on needs and problem-solving. The objective to shape a theoretical dorsal in which intersect empirical analysis (survey-based) on real smart-working experiences, would be strictly related to urgency conditions (as acceptance facilitator), due to the considerable one of the widest "social phenomenon" observable (Covid-19). In this sense, the authors make possible to investigate the relations between need, knowledge, urgency and smart-working acceptance among public sector teachers in Italy.

**Keywords:** Smart-working, Innovation Acceptance, Knowledge, Organizational Changing, Covid-19.

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\* **Christian Rainero** is Associate Professor, Department of Management, University of Turin, e-mail: christian.rainero@unito.it

† **Giuseppe Modarelli** is Ph.D. Student, Department of Management, University of Turin, e-mail: giuseppe.modarelli@unito.it

## 1. Introduction

The difficulty in supporting a phenomenon in fast growing with empirical data, leads the author to base the investigation starting from conceptual and theoretical literature. In this sense, literature about innovation has been widely shared in academic context, appearing capable in highlighting several aspects on acceptance and reluctance possibilities.

The wide research production in this ambit, makes the question stimulating, considering new viewpoints and interpretations; for this reason it would appear controversial and the authors concentrate the efforts on implementing hermeneutical view on the role of urgency variable as acceptance facilitator.

The motivation to analyze a specific sector, as well as public one, born from a gap observed in literature and the peculiarity of the investigation area, which by its nature poses natural barriers to change (Cinar, Trott & Simms,2018; Oliver,1991) also focusing on a specific ambit with high relevance and impact in social organization: teaching profession.

For which concern the gap existing in innovation acceptance, would be based on the absence of urgency variable in social context as a facilitator of innovation acceptance.

That variable would be observable through the emergency due to Covid-19 pandemics. Starting from the concept that nothing could be reset instantly, organizational practice teaches that changing must be guided towards a collective social learning. In fact, according to the aim of the research, the authors consider the innovation acceptance in terms of behavioral change in working habits as time-consuming procedure.

Unexpected results in terms of wide acceptance and smart-working spread, would have been observed during Covid-19 sanitary emergency and based on the concept that the permeability of IT would have interested a wide range of acceptance in several aspects of life. For this reason, the urgency variable would be intended as a cause-effect condition able to incorporate and compress the Rogers' steps (1962) of innovation diffusion.

The research would absorb the assumptions, on the individual side, about the voluntariness in making own knowledge as antecedent for innovation propensity to acceptance (Rainero & Modarelli, 2019), and on the other would provide an implementing hermeneutical view on the role of urgency variable as acceptance facilitator.

The suggestions indicated to introduce the topic would lead to methodologically verified results through a survey-based field analysis, carried out on a sample of n.206 high school teachers in the Italian context.

## 2. Methodology and gap identification

Like any new field of investigation, it is necessary to provide a solid and clear formal structuring of the objectives and methodological steps functional to the research design.

The objective of the contribution would tend to show the role of urgency as a facilitator of innovation acceptance, also providing an overview on the main aspects and concepts related to this ambit.

Primarily it has been operated a database search to frame the possible gap in literature.

The databases queried by the authors are: Business Source Ultimate (BSU); EconLit (EL); Scopus (S). The decision to consider these databases as the most focused on the theme, would be due to the specific characteristics that they provide related to the business and management ambit.

In fact, Business Source Ultimate offers “an unprecedented wealth of peer-reviewed, full-text journals and other resources”<sup>1</sup>; EconLit “is the most reliable full-text database for economic research”<sup>2</sup> and Scopus “indexes content from 24,600 active titles and 5,000 publishers”<sup>3</sup>, providing a specific filter on “Business, Management and Accounting”.

The methodological approach to individuate a gap presence has been operated as reported in Figure n. 1.

Using the databases abovementioned, it has been provided a restriction of selection related to specific “academic journals” and “business, management, accounting” ambit. Thanks to these filters, it has been possible to show the wide literature production about theories of technology acceptance; conversely, a quite ignored variable would be the “urgency”. In fact, only 2 results have been showed by the databases<sup>4</sup> (searching in title, abstract and keywords), adding this criterion to the one of “technology acceptance model” and the filters abovementioned related to the ambit and the type of source. That combination of criteria guides the authors to shows the opportunity in redirecting the research questions deriving from literature review and adding value.

In fact, the scarce consideration of urgency as a great determinant of innovation acceptance, leads the authors to focus the attention on that variable under the light of Covid-19 emergence.

The literature review, based on a selection of relevant sources, according to the proposition of the study, would contribute to the existing literature by comprehensively report an overview of technology acceptance concept through a theoretical reconstruction of the recursive cycle of knowledge intervention that

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<sup>1</sup> [www.ebsco.com/products/research-databases/business-source-ultimate](http://www.ebsco.com/products/research-databases/business-source-ultimate)

<sup>2</sup> <https://www.ebsco.com/products/research-databases/econlit-full-text>

<sup>3</sup> <https://www.elsevier.com/solutions/scopus>

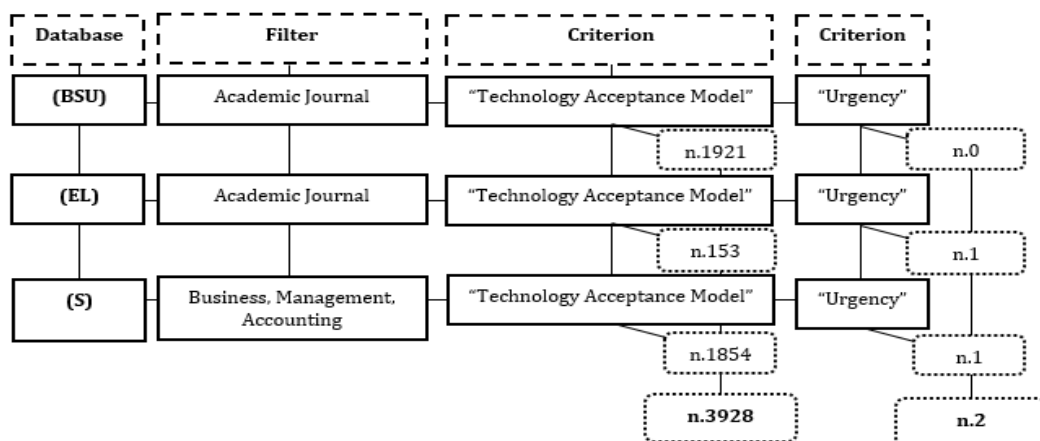
<sup>4</sup> The one titled “Firm and individual level determinants of balanced scorecard usage” (Islam & Kellermanns, 2006) and the other titled “In the long shadows of inaction: the quiet building of a climate protection movement in the United States” (Moser, 2007)

history of humans' innovation provided until nowadays. That contextualization would be functional to the innovation acceptance theory and behavioral change (related to work), assuming that both innovation and new habits would provoke recursive new tools/habits creation and acceptance barriers (Figure n. 5).

Through the theory, the authors try to focus the attention on a specific case (teaching profession smart-working during Covid-19 pandemics), showing the urgency role into the potential application for further research with the aim to conceptualize, analyze and comprehend the power of a variable that may affect the current models, also opening a window on the future innovations adoption.

At theoretical level, the interpretative model relates to how people creates innovation in recursive manner to solve problems starting from a need through knowledge; and how several variables would facilitate innovation acceptance (in this case: urgency).

**Figura n.1 - Gap identification**



Source: our elaboration

The method used by author focuses on interconnection existing between literature, theoretical background and direct observation operated by field analysis through surveys (Burgess,2001) in public sectors.

The survey has been structured on 10 questions graduated on a pentenary Likert scale (1-2 low; 3 mean; 4-5 high) applied to employees (civil servants), specifically teachers employed in Italian high schools (28,16% Males – 71,84% Females; 76,21% between 45-64 years old; 3,88%: 18-29 and 19,90%: 30-44).

The quantification of respondents would be n.206 of n.271, involved in randomized way and on voluntary base, outlining a satisfying response rate about 76% and ensuring a great coverage of representativeness of the specific field of activity.

The authors specifically choose the Italian context and the education environment, because of the direct influence and impact that affects this kind of working activity by the recent Covid-19 pandemics.

Teaching professionals would base their activities in normal condition on a strong emotional effort to guarantee good services levels (Dudau & Brunetto,2020), already noted and evidenced by Fiorilli et al. (2015) they are subject to a high incidence of stress and burnout syndrome.

The possibility to analyze the case proposed would pose the attention on specific work conditions, strictly related to knowledge transfer during non-linear experiences.

### **3. Theory: the recursive process of humans' innovative creation**

The analysis of teaching profession during Covid-19 emergence would permit a double investigation, on one hand related to the acceptance and innovation diffusion, on the other related to the role of urgency and voluntariness in work habits.

If it is well known that the voluntariness plays a crucial role in innovation acceptance, it appears a little ignored the urgency as variable to reduce reluctance.

Conversely, in a recursive cyclical manner, humans create new tools to solve problems. The knowledge side would be the principal foundation of thinking organism in decision-making (Bandura, 1971). In this sense, the question would be related to the literature about innovation reluctance and acceptance focused on conscious decisions, especially based on tools' characteristics (Agarwal & Prasad, 1997).

*"We have not made our world. So far, we have not even changed it much, compared with the changes achieved by animals and plants. Yet we have created new kind of products or artefacts which promise in time to work changes in our corner of the world as great as those worked by our predecessors"* (Popper,1966).

According to Popper it could be possible to say that, in light of emergence of needs, people creates new tools to satisfy these ones.

At every stage of the humans' civil evolution, innovation occurred like barter and salt before, after money, to satisfy need of exchange. Subsequently the need to memorize information inherent the exchanges facilitated by the emergence of bookkeeping practice as product of human knowledge (Sangster,2016).

Later, scientific organization of labor and mechanization satisfied the need of mass production. The society evolution based on ICT, became important to satisfy need of efficiency and the Internet made possible the circulation of a huge amount of information on the web.

The problem of the actual knowledge, informational and networked society would be discontinuity (Drucker, 1992) and above all information overload (Kleijnen, Lee & Wetzels, 2009) related to uncertainty (Buman,2000).

The European Council in 1993 opened a window on the notable question related to the IT diffusion, posing emphasis on a new information-based industrial

revolution (Rec.Eu.C., 1993). Twenty-seven years after, the problem of information overload could create innovation reluctance (Kleijnen Lee & Wetzels,2009) due to the fragmented and uncertain huge amount of information creating just apparently certain individual knowledge frames and confusion in decision-making (Kleijnen Lee & Wetzels,2009).

A new necessity emerges to enhance and improve the tool capacity in memorizing data and creating a knowledge context; recent collaborative and distributed technologies could fill this gap.

For which concern research questions, it appears not so important how people acquire information, that could be the base for further studies, but the interesting aspect could be represented by the need (Maslow, 1943) of knowledge in abstract. On the one hand, there would be a strong need to manage the amount of information in uncertainty reduction through IT tools creation. On the other hand, an intrinsic partial information acquiring.

The intent to create a knowledge-based society, would risk the contrary. This shows that often the ideal objective would be likely the own weak point.

Innovation is defined by Chen, Zhaohui & Xie (2004) as interceptor of new product, new technology, new market, new material, new combination.

Albury (2010) defines innovation as the essential of improvement, a need to be institutionalized as a deep value.

In this sense, successful innovation would be the creation and implementation of new processes, products, services and methods of delivery, which result in significant improvements in outcomes, efficiency, effectiveness or quality.

To satisfy that need, people consciously or not create new tools and the industrial revolutions up to the fourth show that capability (Figure n. 5).

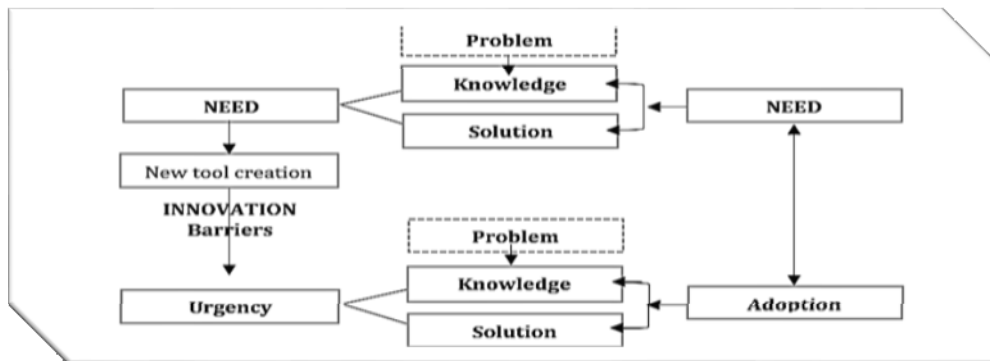
If barriers to innovation acceptance (Ram, 1987) and reluctance to changes (Oliver, 1991) would represent natural occurrence, knowledge role would assume the trigger for value creation.

In terms of Knowledge-based theory (Grant, 1996), on one hand it could favor innovative creations and solutions, on the other one, it could favor acceptance in a recursive and strictly interconnected self-fulfillment prophecy (Merton, 1973) of a new “value generative society”.

To involve the reader in a better comprehension, the authors provide to shape in Figure n. 2 the interpretative model through which it would be possible to explain the Figure n. 5. In fact, Figure n. 2 would be representative of the general cycle that human-beings take in place during a new tool creation (innovation) and its acceptance. So the phases would be referable to: (1) starting from a need to face a problem; (2) activating knowledge acquired to find a solution; (3) feeling the need of a new tool and its creation; (4) barriers to adoption; (5) the need of adoption would match by knowledge the need of problem-solving; (6) external variable emergence (as urgency that could stimulate and accelerate acceptance process).

So, the Figure n. 2 would show a kind of interpretative model of recursive innovation creation and acceptance among human-beings, integrating need, knowledge and urgency variable inoculated by the recent Covid-19 pandemics.

Figure n. 2 - The interpretative model



Source: our elaboration

The advancement in digital and collaborative technologies is actually framing new contexts in which significant changes in adoption processes and new perspectives on knowledge operate.

New human-machine interactions, are asking to redesign and reengineer traditional paradigms of work.

The fourth industrial revolution and the faster information sharing and knowledge acquisition processes would constitute new ambits of interest, research and application. One of this would reflect the possibility of studying the urgency variable (due to Covid-19 pandemic) to provide a timely acceptance of relatively new working condition, but scarcely adopted until now: smartworking.

In literature, several theories of innovation acceptance and diffusion emerged during the years.

Rogers (1962) shaped the lines of the Theory of Innovation Diffusion, Davis (1989), Davis, Bagozzi and Warshaw (1989) defined the first Technology Acceptance Model, subsequently developed by Venkatesh and Davis (1996; 2000).

Another development of the theory derived from the previous models, would be the Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, Davis & Davis, 2003), finally the last version of Theory of Acceptance Model has been provided by Venkatesh and Bala (2008).

The Technology Acceptance Model was shaped by Davis, Bagozzi and Warshaw (1989) with the aim to individuate the determinants of PCs acceptance, testing two concepts: the perceived usefulness<sup>5</sup> and ease of use<sup>6</sup>.

The following development of the model provided by Venkatesh and Davis (1996) considered no more the influence of perceived usefulness and ease of use on

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<sup>5</sup> Perceived usefulness: the degree to which a person believes that using a particular system would enhance job performance (Davis, 1989).

<sup>6</sup> Perceived ease of use: the degree to which a person believes that using a particular system would be free from effort (Davis, 1989).



attitudes and intentions to use the tool, but the influences existing between perceived usefulness and ease of use on behavioral intentions.

In this sense, an important consideration would have been made by Venkatesh and Davis (1996; 2000) declaring great assumptions for the case proposed related to teaching profession smart-working and students' e-learning perspective that on one hand, could create new challenges, but on the other one, new digital functional divide.

In fact, they theorized that the perception of usefulness would be a consequence of the individual assessment to match the tool characteristic with its possibility to increase job performance.

In this sense, the model would have been interpreted both under the social influence variables (subjective norms, voluntariness, image) and the cognitive ones (job relevance, output quality, result demonstrability, perceived ease of use).

In 2003 Venkatesh, Morris, Davis and Davis, (2003) included in the previous model other variables theoretically general, as the performance expectancy, effort expectancy, social influence, facilitating conditions, gender, age, experience and voluntariness.

The last version of Theory of Acceptance model shaped by Venkatesh and Bala (2008) included a combination of factors linking variables (Subjective norm, Image, Job relevance, Output quality, Result demonstrability, Experience, Voluntariness and in additions Anchors and Adjustments<sup>7</sup>) able to modify perceived usefulness, ease of use and intention to accept and use innovation.

The criticisms related to the debate on Theory of Acceptance models during the years, made the ambit a great field to develop new ideas, new point of views, implementing solutions, adjusting and providing other specific variables, as the authors of this study propose.

The model proposed in Figure n. 5 would be representative in term of need, knowledge, innovation and barriers cycle in recursive manner during the main steps of societal challenges including industrial revolutions (1st, 2nd, 3rd, 4th) and EU requirements (EU document, 1993; EU document, 2017; Boucher,2017).

The interpretative framing activity has been operated in light of the actual society and perspectives view on the near future.

In this perspective, other needs would emerge and other solutions to satisfy them would have been created under the humans' knowledge intervention. In fact, the authors consider smart working as an innovation, due to the fact that both share similar traits: (1) fruit of knowledge creative power and (2) constituent of changing in habits. In this sense, both would follow the almost equal rules of innovation acceptance (Lally et al., 2010; Oliver,1991).

In this case, the need to constitute conditions for continuing work activities through a dematerialized workplace would encounters the possible reluctance to behavioral change (Oliver, 1991).

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<sup>7</sup> Anchors: Computer self-efficacy, perceptions of external control, computer anxiety, computer playfulness; Adjustments: perceived enjoyment, objective usability.

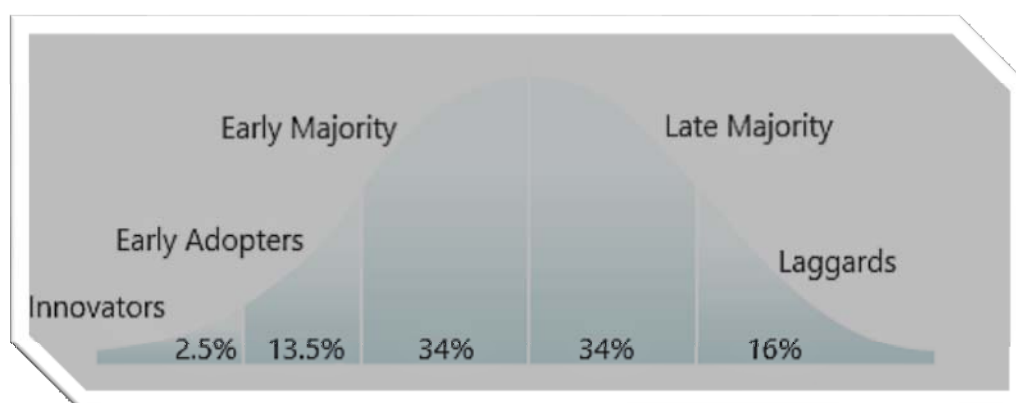


The authors also consider the fact that the intervention of knowledge, would moderate the reluctance, because ICTs are relatively not new technologies with a wide spread in several ambits of life, reflecting the concept of readiness (Parasuraman and Colby,2001).

For this reason, the condition of informed context would be respected providing a reduction of reluctance levels, despite the case of extreme urgency.

The analyzed segment would reflect the favorable conditions for the emergence of new working habits in relatively narrower time ranges, reducing the space among Rogers' adopters for innovation diffusion (Roger, 1962) (Figure n. 3) and restricting the ranges of behavioral changes elicited by Lally et al. (2010), because of the need to constitute conditions to continue working activities, contrarily to a strong reluctance observed in the past, taking place an almost completely acceptance during the emergency period.

**Figure n. 3- Rogers' Bell Curve: Diffusion of Innovation**



Source: our elaboration from Rogers (1962)

The theoretical dorsal and interpretative hermeneutical views have been provided by the authors functionally to the following research questions deriving from literature review. The direction of the investigation could be represented as follows:

RQ1: what is the role of urgency in accepting broad-spectrum innovation in the knowledge society?

RQ2: would it be possible to configure the urgency variable in the innovation acceptance model and behavioral change in working habits?

RQ3: How can urgency and voluntariness be configured in a non-mandatory regulatory framework in the acceptance of innovation and change in the workplaces?

## **4. Framing contexts and hermeneutical paradigms**

### ***4.1 How it is possible to intersect Need, Knowledge, Innovation and Barriers in Public Sector***

On the theoretical dorsal created by the authors, it would be possible to consider the central role of knowledge as trigger from need to solution, pointing an interesting view on the actual knowledge environment provided by ICT.

The presence of innovation barriers naturally existing in every ambit of life and for public sector, the “knowledge society” characterized by liquidity, discontinuity and uncertainty, would make the recent emergency due to Covid-19 spread and the measures adopted by governments to cope it (favoring working activities in an alternative manner), a strong playground to observe the power of urgency as trigger of innovation acceptance.

Especially the observation and investigation activity would be conducted under the light of a “value generative society” perspective, in terms of the recursive cycle to produce and reproduce solutions to social problems.

The theoretical view has been triggered by that necessity. A multifaceted conception would interconnect the need of knowledge in general and decision-making, teleologically oriented.

The latter aspect would be proper by thinking-rational-man in reaching knowledge through strategic and creative expressions (Guilford,1950). Human beings create tools for process, memorize, retrieve and communicate information and in the recursive process Need, Knowledge, Innovation and Barriers appear invariant. In light of the 4.0 industrial revolution emergence, interpreted as a new evolution of social life, the new economy nourishes itself by information and knowledge (Gascò,2003).

This kind of knowledge creates frictions, especially based on information overload (Kleijnen, Lee & Wetzels,2009) as noted by EU document in 1993.

The need expressed could be rediscovered in the role of book-keeping from the origins because of the determinant circumstance that characterizes it as an innovation for working activities, in parallel with the recent smart-working innovative approach.

The discourse on knowledge appears instrumental to frame both the internal and external side in innovation acceptance and conscious-decision-making.

For this reason, it would be possible to say that innovation acceptance would be based on knowledge when self-constructed by voluntariness and through information-seeking or externally produced by managerial strategies. In a “from knowledge, by knowledge, to knowledge” cyclical context (Figure n. 5), fractures in social life represent sources of reflection.

Recent Covid-19 emergency would renew the human fragility, but to the attentive observer it would show how humans' knowledge plays a crucial role to solve problems, starting from a necessity condition and creating something new to better conduct life.

In terms of organization behaviors and social behaviors, the recent pandemic case would frame the potentialities of urgency in terms of innovation acceptance accelerator (Figure n. 5).

The Covid-19 emergency and smart-working solution would be a great starting point for the investigation under the lens of the recursive process of innovation creation, also in working habits.

#### ***4.2 Innovation acceptance in light of knowledge and decision-making***

Reluctance to change and innovation that implies changing is natural attitude in human-being (Dent & Goldberg,1999; Ram,1987, Oliver,1991).

In Kleijnen et al. (2009) point of view, reluctance would be based mostly on information overload that creates anyway a lack of knowledge.

On the other hand, people desire information (independently of the acquisition modes) to make conscious choices (Berryman,2008).

Considering reluctance as rational informed decision and a barrier to innovation adoption (Kleijnen, Lee & Wetzels,2009), in light of decision-making theory, it would appear clearly the role of knowledge on innovations characteristics (Agarwal & Prasad,1997), and on the other hand would show the repercussions affecting managerial implications.

Ram (1987) observes that innovation resistance is not the obverse of innovation adoption, because the latter begins only after a natural initial resistance.

In this sense, knowledge could be a great antecedent for innovation acceptance and the crucial motive that led the authors to choose it for the theoretical model conceptualization. In view of individual and collective need to know, developing creative processes to solve problems would create a double condition.

On one hand, the innovation would be facilitated in terms of acceptance by the need, on the other one, to operate a wide range acceptance, it would be fundamental to convince the potential user to acquire something new and modify behaviors according to the innovation emergence in individual life.

In this sense, the voluntariness would be crucial in taking action and making decisions in a conscious manner (Hayek,1945).

On the external side, strategies for policy-makers, companies per se and marketers, would embrace informed context creation finalized to prepare people to "*innovation welcome*". In the case analyzed, this moderator role has been placed by the wide spread and usage of ICTs, according to the assumption that innovation is extremely dependent on the availability of knowledge (Cardinal, Alessandri & Turner,2001).

In fact, it would be possible to consider the knowledge context creation around innovations or changings as managerial implication to reduce complexity.

Public sector appears a great field in which find interexchange between social, governmental and political-economic perspectives, under the lens of constraints and control enhanced by N.P.M. (Diefenbach,2009).

In fact, recent literature (De Vries, Bekkers & Tummers,2016) attests that scholars and practitioners are becoming to increase interest about innovation, especially for public sector because of the possible contribution to generate and improve quality enhancing solutions for complexity (Koppenjan & Klijn,2004).

That means an active comprehension that imply individual voluntary participation (Polanyi,1958).

In this sense, a distinction could be done: (1) the voluntariness is an internal aspect; and (2) influence is an external one. Covid-19 would be an external influence factor, a fracture that shows another variable to favor innovation acceptance, facilitating behavioral change in working habits: urgency (in absence of top-down constraints and obligations always characterizing public sector procedures).

## **5. Intersecting innovation acceptance, urgency contexts and teaching profession smart-working**

### ***5.1. Teachers' smart working: an innovation acceptance paradigm***

With the aim to specify the role of usefulness, perceived ease of use and the acceptance of information technology, Davis (1989) declares that IT offers a great potential to improve white collar performance.

Davis (1993) declares that the choice of functional and interface characteristics of a new system are largely under the control of information systems designers, developers, selectors and managers.

According to the possibility to consider perceived usefulness and ease of use of a wide spread technology as the ICTs are, the authors consider to transfer the discourse about innovation acceptance on the smart working, specifically on a single category of public sector workers: teachers.

Teachers would be one of the most under pressure workers in terms of emotional labour (Rayner & Espinoza, 2016) and that characterizes the tasks of the job, according to the complexity to favor a great learning context through empathic behaviors (Bellet & Maloney, 1991).

In light of ever increasing technology context and artificial intelligence emergence (Dudau & Brunetto,2020) that are leading organizations to human replacement (Frey & Osborne,2017), several job would be not replaceable by machines because of strict relation occurring between job tasks and human prerogatives.

Teaching profession would be a typical occupation for Italian citizens that counts 1/3 of total employed in Italian public sector<sup>8</sup>.

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<sup>8</sup> <https://www.eticapa.it/eticapa/ragioneria-generale-dello-stato-conto-della-pa-2015/>

According to the fact that IT would offer a great potential to improve white collar performances on the job, teaching methods would be enhanced by technological tools, and ICTs would radically change the educational environments and the whole teaching profession. For which concern the dematerialization of workplaces and the change in working habits, a great example to consider another variable in innovation acceptance models could come from the recent Covid-19 pandemics.

This dramatic event could be considered a strong privileged observation field for social researchers, permitting to study behavioral change in a wide spectrum, providing a urgency environment.

The voluntariness and non-mandatory environment, already reproduced by Venkatesh and Davis (2000) in testing the Technology Acceptance Model, characterizes Covid-19 pandemics (2019-2020). That would be a great possibility to investigate specific ambits of social life related to business and management viewpoints, also permitting to furnish critical perspectives. In this case, the investigation conducted by the authors focus the attention on a specific knowledge-driven job without specific constraints during the observation period.

## ***5.2 Covid-19 spreads and teachers smart working***

Epidemics, earthquakes, wars etc. ever occurred from ancient times to nowadays, would be considered as rupture points in social life (Dahlberg, Rubin & Thanning Vendelø, 2016).

The uncertainty and discontinuity (Drucker, 1969) periods related to disaster crisis appear strictly shaped by liquidity perceptions of social life (Bauman,2000).

In this sense, uncertainty, anxiety and urgency would be crucial points to modify behaviors. As affirmed by Drabek (2012) disasters would be considered accidental and uncontrollable events occurred in determined space and time through which a society would have been affected by loss and dangers in different ambits.

Quarantelli (2005) provides another definition of disasters, considering them as *“conjunctions of historical happenings and social definitions of physical harm and social disruption”*.

Disasters, especially epidemics, when occurred in global society would become rapidly pandemics and interconnected phenomenon (Ali & Keil, 2008), especially because the response appears usually complex (Coppola,2006).

The recent Covid-19 pandemic event (2019-20) would be a global disaster, affecting (on 8<sup>th</sup> May 2020) 187 countries/regions, with 270.279 deaths<sup>9</sup>.

During the Covid-19 epidemic event, several urgent measures have been adopted all around the globe by the governments.

In Italy have been published several DPCM (Decrees of the President of the Council of Ministers) containing urgent measures regarding the emergency due by Covid-19<sup>10</sup>.

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<sup>9</sup> <https://coronavirus.jhu.edu/map.html>

According to the measures to prevent and contain contagion spread, schools, universities and several working activities have been closed in physical place, but technical IT solutions solved the problem providing a mediated normal activity through workplaces dematerialization.

Managerial literature, already for years, suggested a need to change work organization (Pèrez Pèrez, Sánchez, Carnicer & Jiménez, 2004).

As suggested by Torre (2015) during the last decade emerged the flexible work, actually substituted by the term smart working, indicating a quite discretionary use of time and flexibility to work organization. So, the recent sanitary situation inaugurated the "massive" phase of working in a smart way (Torre, 2020).

The emergency condition would renew interest in a relatively forgotten working possibility. On this wake, the authors concentrate the effort in investigating the teaching profession smart working.

Smart-working<sup>11</sup> would be based on objective-driven approach also for public administrations<sup>12</sup>, defining the perspective of agile-working (Pèrez Pèrez, Sánchez, Carnicer & Jiménez, 2004; Sarti & Torre, 2017, Chiaro, Prati & Zocca, 2015).

This perspective would go beyond boundaries, permitting work in locations different from the single home (i.e. restaurants, hotels, train etc.), more oriented to the BYOD<sup>13</sup> (Ballagas et al., 2004).

In this condition, the employees would be free to move and work when and how they want, focusing the attention on the result, freely fixing time and pursue the objectives related to job tasks. A question arises spontaneously: can all jobs be translated in smart mode?

Resistances to these approaches occurred among employees from Seventies. In fact, the initial development was very low due to technological limits and high costs of ICTs at the time (Pèrez Pèrez, Sánchez, Carnicer & Jiménez, 2004).

White collars and managers are reluctant, as the majority of employees, to change working habits (Oliver, 1991), especially in public sector in favor of innovation (Cinar, Trott & Simms, 2018) when they cannot see the need for change or perceiving usefulness and ease of use (Davis, 1989).

The motivations of low acceptance and diffusion would have been provided by several authors (Pagonis, 1995; Chapman et al., 1995; Shin et al., 2000; Rasmussen & Corbett, 2008).

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<sup>10</sup> Official Gazette General Series n.52, 01-03-2020; n.59, 08-03-2020; n.62, 09-03-2020; n.64, 11-03-2020.

<sup>11</sup>(i.e. Law n. 191-1998; Legislative Decree 3rd February 1993, n. 29; Decree of the President of the Republic n. 70-1999; Framework agreements 2000 and 2004) - Available at: [https://www.cliclavoro.gov.it/Aziende/Documents/accordo\\_interconfederale\\_telelavoro\\_9\\_6\\_2004.pdf](https://www.cliclavoro.gov.it/Aziende/Documents/accordo_interconfederale_telelavoro_9_6_2004.pdf)

<sup>12</sup>(i.e. Law n.81-2017, art.18-24; Directive n.3-2017) - Available at: <http://www.funzionepubblica.gov.it/articolo/dipartimento/01-06-2017/direttiva-n-3-del-2017-materia-di-lavoro-agile>

<sup>13</sup> BYOD: Bring Your Own Device



Davis, Bagozzi & Warshaw (1989) affirm that *“Computer systems cannot improve organizational performance if they aren't used”*; the same would be valid for smart-working.

Among the public administrations, the most significant growth was recorded: in one year, the structured smart-working projects doubled in the public sector (from 8% to 16%)<sup>14</sup>.

By contrast, organizational practice suggests that a change needs guidance (Hinna, 2009); the proposed case provides a divergent perspective, in agreement with the fact that a technology would have been ready to be accepted, the sentiment of urgency produced by Covid-19 spread would have zeroed, or at least restricted, the times of acceptance and the change of working habits, replacing resistances and avoidance strategies (Oliver, 1991) in favor to a maintenance of good public service quality levels.

The DPCM (Official Gazette General Series n.52, 1 March 2020) declares the *“closure of the educational services for children and schools of all levels, as well as higher training institutions, including Universities”*, also affirming *“the possibility of carrying out distance learning activities”*<sup>15</sup> in the Regions concerned; subsequently enlarging the suspension to the whole national territory, considering the WHO statements (30th January 2020) of international public health relevance emergency.

The DPCM published on The Official Gazette General Series n.64, 11-03-2020, concerns the possibility for public administrations *“working activities in an agile way”*.

The condition of preference and the existing parallelism between voluntariness and mandatory solutions would ensure a privileged observation point on the innovation acceptance and organizational working habits.

Probably the perception of the role in educational context, the commitment devoted to guide youth through the first emergency after Great Wars in occidental territories and the sense-making in taking care of students as future generation, moved teachers to voluntary redirect and change working habits.

By contrast, the authors investigate through specific perspectives, not on why, but on how and under which condition teachers decided to boost smart-working.

## 6. Results

For which concern the use of technology and application of smart/agile-working to educational environment (L. n.107/2015) dematerializing working places (teachers' perspective) and learning contexts (students' perspective) (Song,2014;

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<sup>14</sup>[https://www.osservatori.net/it\\_it/osservatori/comunicati-stampa/crescita-smart-working-engagement-italia-2019](https://www.osservatori.net/it_it/osservatori/comunicati-stampa/crescita-smart-working-engagement-italia-2019)

<sup>15</sup> “the possibility of carrying out distance learning activities”, would open a window of discretion under the lens of mandatory provisions. So, that condition would refer to voluntariness and non-mandatory innovation and change acceptance.

Hopkins, Sylvester & Tate,2013; Hockly,2012) would demonstrate strong efforts in terms of habits changing.

According to the evidence emerging in psychological ambit (Lally et al., 2010), humans need from 18 to 254 days to change behaviors and habits.

The acceptance evidence of smart-working approach among teachers would be widely unexpected, considering the higher average age of employees.

In light of the results presented by the government (94% acceptance of students reached and 89% who prepared materials)<sup>16</sup>, smart-working for Italian teachers would seem to have compressed Roger's bell curve, through a wide application of new working habits in short time. In fact, the data show an unprecedented acceptance and diffusion, although the qualitative aspects linked to the sphere of internal managerial attribution are missing.

The authors, without taking into account the possible critical issues that should be implemented under the students' perspective and in areas of higher education, present the data as the results of survey-based field analysis (Figure n. 4).

The sample of teachers, of which n.206 respondents on 271 of total (about 76% of response rate), have been called to answer the following questions with the aid of five points Likert scale to graduate accordance:

1. I believe that smart working can have positive effects on family management;
2. I believe that smart working can have positive effects in terms of pollution reduction and reduction of labor-related costs;
3. I believe that smart working can be a valid alternative to traditional work;
4. I believe that smart working can considerably replace traditional work;
5. I implemented smart working;
6. I believe I implemented smart working because I have been waiting for this possibility for long-time;
7. I believe I implemented smart working to align myself with urgent organizational requests;
8. I believe I implemented smart working to align me with the work of colleagues;
9. I believe that the urgency is determinant in implementing smart working;
10. I believe that the smart-working implemented in this period is a choice born by necessity and urgency.

For which concern the survey proposed the 53.40% declares that smart-working would have positive consequences on family activities and management, also considering (79.13%) that smart-working would contribute to reduce pollution and labor-related costs.

Contrarily only the 36.41% of the sample involved believe that smart working can be an alternative to traditional work, probably due by the social need and relational characterizing teaching profession.

In fact, in this case only the 10.19% declares that smart working will considerably substitute traditional work, probably due by the fact that the learning contexts would not be mediated by a screen.

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<sup>16</sup> <https://raiparlamento.raai.it/#>

Specific data would be crucial related to the innovation acceptance, in fact, during the Covid-19 emergency period the 75.24% of teachers declare they implemented the smart-working (on-line teaching solutions), but not because of they have been waiting for this possibility by long time (56.37%) (confirming the percentages aforementioned against the substitution of traditional work).

Surprisingly, the 86.34% of teachers involved declare they accept the smart working to align the operational activities to the urgency condition, and 94.15% affirm they implemented smart working due to urgency. In addition, the 97.07% of teachers declare that the choice related to smart working would be exclusively fruit of necessity and urgency.

This condition would be symptomatic of the fact that the teachers would not change their traditional activity with agile-work-applications.

By contrast, they do not deny that smart working can have positive results on family-management and on pollution and related-labor-costs.

As regards the innovation acceptance theory, it could be useful to critically analyze the data relating to 51.72% of respondents, who claim to have implemented smart working as a kind of alignment to the activity of other colleagues.

In this sense, the urgency variable actually tends to compress the timing of the Rogers' bell curve, without prejudice the existing configurations of early majority and followers (late majority). So, urgency would appear a process accelerator of innovation acceptance.

Pointing attention on these exploratory data, several managerial implications would emerge in using smart working in education context for improving learning activities during emergency period, ensuring service continuity.

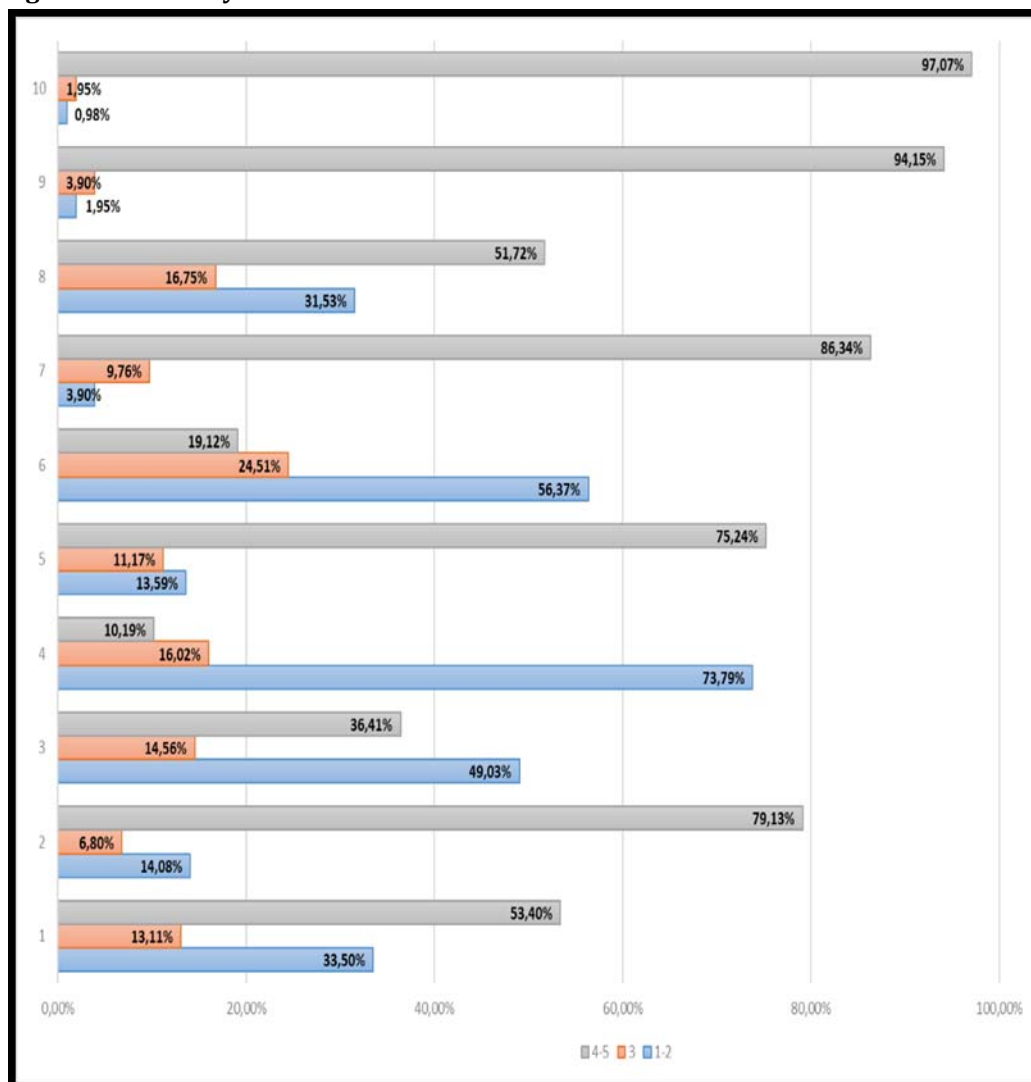
For example, the presence of not univocal platforms and connection problems, related to private devices and software could create security breach. Students engagement difficulties and devices characteristics or the absence (in several cases) could create new divide.

Distance teaching done without a common procedure on the national territory could create heterogeneity on service access.

Possible inferences could be made on these aspects and the authors aim to furnish insights and stimuli, encouraging further developments also from interdisciplinary perspectives.

On the other hand, the research would show embryonic consideration about the probable reluctance to completely change the traditional environment that constitutes teaching profession in normal conditions, deserving the smart-working approach in this professional area to the urgency period.

Figure n. 4 - Survey results



Source: our elaboration

## 7. Conclusion

Considering that Hartley, Sorensen & Torfing (2013) try to dispel the myth of private sector superiority in innovation, affirming that public and private are similar in drivers, but strategies are key success factors, unfortunately not absolute and valid per se.

According to that point of view, the authors suggest that public administration would be a great field of study related to innovation in all its aspects (barriers,

strategies, governance, leadership, social, economic and environmental impact). In addition, the recent Covid-19 emergency would furnish to researchers a great playground and new perspectives, thanks to the one of the wider considerable social phenomenon ever experienced after Global Wars.

For this reason, the authors propose a field analysis related to a possible aspect influenced by a variable never seen before with this spread.

If on one hand, the authors propose a theoretical framework of societal change, based on knowledge recursive intervention from needs trigger, on the other one precisely focus the analysis of the case about innovation acceptance on teaching profession smart-working through the role of urgency.

In fact, the data would verify the presence of urgency as a variable able to expand literature in innovation acceptance area.

The theoretical dorsal and the results of the analysis would underline urgency as a process accelerator of innovation acceptance, but for which concern teaching profession, it would be only a temporary solution, without the power to create a stable modification of habits. In this sense, other managerial strategies will need to be improved to durably modify teaching activity.

Further development of the research would provide investigations on knowledge-strategies as external variables to promote and facilitate innovation acceptance, mitigating barriers as managerial implication. Public sector would be a great candidate to provide this kind of field analysis.

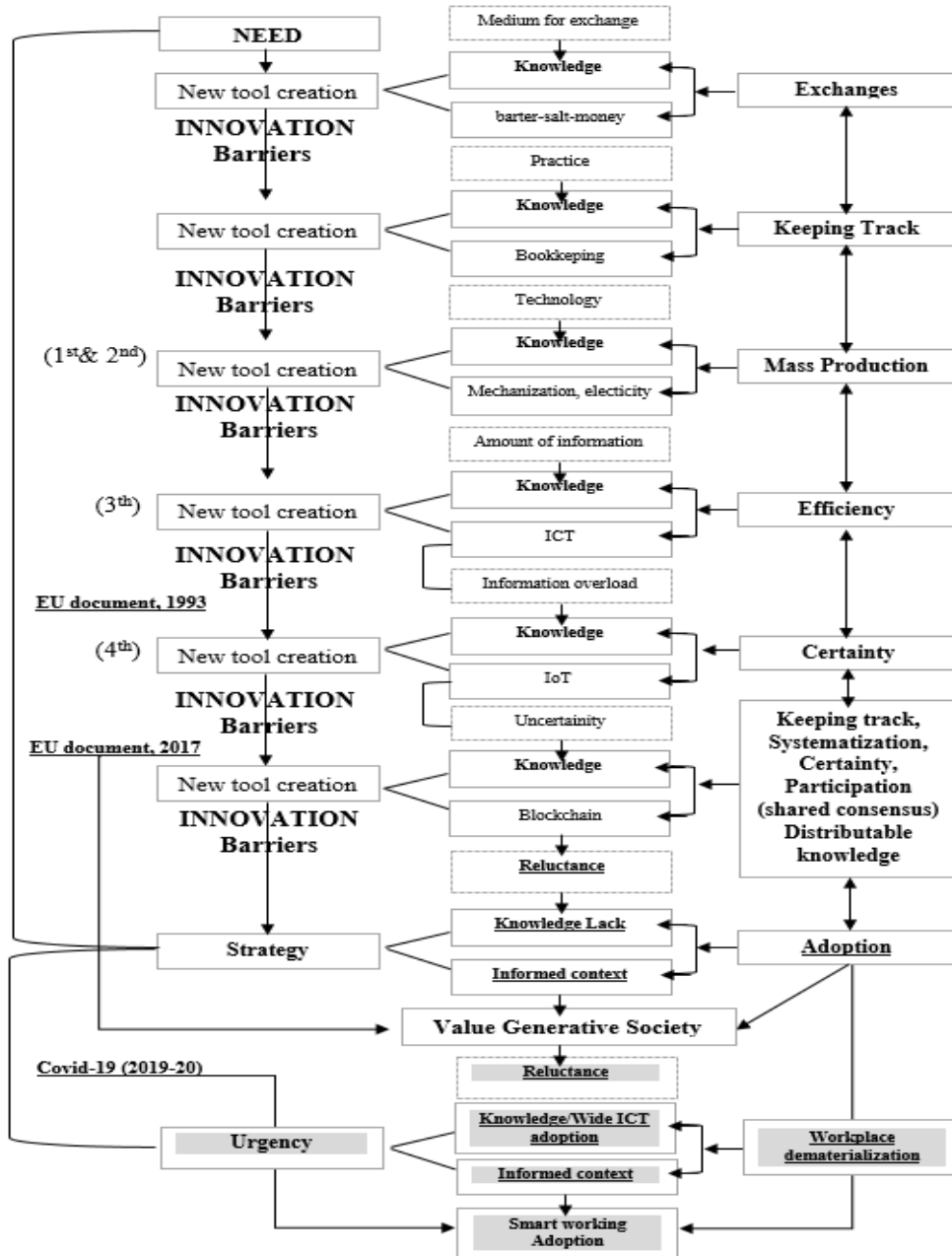
For further research and developments, it would be possible to consider the role of knowledge as a facilitator variable of innovation acceptance (at this stage deduced from literature) focusing the attention on the teachers' perspective (perceived usefulness and ease of use) related to the smart teaching activity and its impacts on professionals at school and higher education contexts (universities) in parallel with students' e-learning perspective in non-urgency environment. Once verified that knowledge could be an antecedent of acceptance at theoretical level through the recursion of historical events, further research could deepen investigate on the prevention of reluctance (strategic knowledge management) strategically oriented to fill the lack of knowledge in public sector about collaborative infrastructures (i.e. in terms of potentialities, characteristics and risks).

That could favor the emergence of propensity to acceptance, as well recognized for voluntariness variable (Rainero & Modarelli, 2019).

A peculiar feature of the research would be the ability to capture a frame during a specific period in evolution, in which a temporary moment was fixed for which no obligation was required top down for distance teaching, underlining a sort of charitable perspective for teaching professions during a quite irreproducible context of extreme emergency (Covid-19).

## Appendix

Figure n. 5 - Evolution steps: the role of needs in societal problem-solving and urgency in smart-working adoption



Source: our elaboration



## References

- Agarwal R., Prasad J. (1997) The Role of Innovation Characteristics and Perceived Voluntariness in the Acceptance of Information Technologies. *Decision Sciences*, Vol.28, No.3, 557-582.
- Albury D. (2010) Fostering innovation in Public Services, *Public Money and Management*, Vol.25, No.1, 51-56.
- Ali S. H., Keil R. (2008) *Networked disease: Emerging infections in the global city*, Chichester, Wiley-Blackwell.
- Ballagas R., Rohs M., Sheridan J.G., Borchers J (2004) BYOD: Bring Your Own Device, in Proceedings of the Workshop on Ubiquitous Display Environments, Ubicomp.
- Bandura A. (1971) *Social Learning Theory*, General Learning Press, New York, 1-46
- Bauman, Z. (2000) *Liquid modernity*, Cambridge, UK, Polity Press.
- Bellet P.S., Maloney M.J.(1991) The importance of empathy as an interviewing skill in medicine, *JAMA*, Vol.226, No.13, 1831-1832.
- Berryman J.M. (2008) Judgements during information seeking: A naturalistic approach to understanding the assessment of enough information, *Journal of Information Science*, Vol.34, No.2, 196-206.
- Boucher P., (2017) How blockchain technology could change our lives, *European Parliament Research Service*, 1-28.
- Burgess T. (2001) *A General Introduction to the Design of Questionnaires for Survey Research*, University of Leeds, 1-27.
- Cardinal L.B., Alessandri T.M., Turner S.F (2001) Knowledge codifiability, resources and science based innovation, *Journal of Knowledge Management*, Vol.5, No.2, 195-204.
- Chapman A., Sheehy N.P., Heywood S., Dooley B., Collins S.C. (1995) The organizational implications of teleworking, *International Review of Industrial and Organizational Psychology*, Vol. 10, 229-48.
- Chen J. Zhaohui Z., Xie H.Y (2004) Measuring Intellectual Capital: a new model and empirical study, *Journal of Intellectual Capital*, Vol.5, No.1, 195-212
- Chiaro G., Prati G., Zocca M. (2015) *Smart working: dal lavoro flessibile al lavoro agile*, Milano, FrancoAngeli .
- Cinar E., Trott P., Simms C. (2019) A systematic review of barriers to public sector innovation process, *Public Management Review*, Vol.21, No.2, 264-290.
- Coppola D.P. (2006) *Introduction to international disaster management*, Oxford, Butterworth-Heinemann
- Dahlberg R, Olivier R., Thanning V.M.. (2016) *Disaster Research: Multidisciplinary and International Perspectives*, Routledge, London and New York, Taylor & Francis Group
- Davis F. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly*, Vol.13, No.3, 319-340
- Davis F.D. (1993) User acceptance of information technology: system characteristics, user perceptions and behavioral impacts, *International Journal of Man-Machine Studies*, Vol.38, No.3, 475-487.

- Davis F.D., Bagozzi R.P., Warshaw P.R. (1989) User Acceptance of Computer Technology: A Comparison of Two Theoretical Model, *Management Science*, Vol.35, No.8, 982-1003.
- De Vries, H. Bekkers, V., Tummers L. (2016) Innovation in the public sector: a systematic review and future research agenda, *Public Administration*, Vol.94, No.1, 146-166.
- Dent B.E., Goldberg G.S. (1999) Challenging “resistance to change”, *Journal of Applied Behavioral Science*, Vol.35, No.1, 25-41.
- Diefenbach T. (2009) New Public Management in Public Sector Organizations: The Dark Sides of Managerialistic ‘Enlightenment’, *Public Administration*, Vol.87, No.4, 892-909
- Drabek T.E. (2012) *Human system responses to disaster: An inventory of sociological findings*, New York, Springer Verlag.
- Drucker, P.F. (1969) *The age of discontinuity: Guidelines to our changing society*, New York, Routledge
- Dudau A., Brunetto Y. (2020) Managing emotional labour in the public sector, *Public Money & Management*, Vol.40, No.1, 11-13.
- Fiorilli C, De Stasio S., Ciangriglia L, Serpieri R. (2015) *Salute e benessere degli insegnanti italiani*, Milano, FrancoAngeli.
- Frey C.B., Osborne M.A. (2017) The future of employment: How susceptible are jobs to computerisation?, *Technological Forecasting and Social Change*, Vol.114, 254-280.
- Gascò, M. (2003) New technologies and institutional change in public administration, *Social Science Computer Review*, Vol. 21, No.1, 6-14.
- Grant, R.M. (1996) Toward a Knowledge-Based Theory of the Firm, *Strategic Management Journal*, Vol.17, 109-122.
- Guilford, J. P. (1950) Creativity, *American Psychologist*, Vol.5, No.9, 444-454.
- Hartley J., Sørensen E., Torfing J., (2013) Collaborative Innovation: A Viable Alternative to Market Competition and Organizational Entrepreneurship, *Public Administration Review*, Vol.7, No.6.
- Hayek F.A. (1945) The use of knowledge in Society, *The American Economic Review*, Vol.35, No.4, 519-530
- Hinna A. (2009) *Organizzazione e Cambiamento nelle Pubbliche Amministrazioni*, Roma, Carocci Editore.
- Hockly N. (2012) Tech-savvy teaching: BYOD, *Modern English Teachers*, Vol.21, No.4, 44-45.
- Hopkins, Nathan, Sylvester, Allan, & Tate, Mary (2013) Motivations for BYOD: An investigation of the contents of a 21st century school bag. In Connolly, R, van Heck, E, Batenburg, R, Spiekermann, S, & van Hillegersberg, J (Eds.) *Proceedings of the 21st European Conference on Information Systems*
- Islam M.A., Kellermans F.W.B. (2006) Firm and individual determinants of balanced-scorecard usage, *Canadian Accounting Perspectives*, Vol.5, No.2, 181-207.
- Kleijnen M., Lee N., Wetzels (2009) An exploration of consumer resistance to innovation and its antecedents, *Journal of Economic Psychology*, Vol.30, 344-357.

- Koppenjan J. Klijn E.H. (2004) *Managing uncertainties in networks, A network approach to problem solving and decision making*, London, Routledge
- Lally P., van Jaarsveld C.H.M., Potts H.W.W., Wardle J. (2010), How are habits formed: Modelling habit formation in the real world, *European Journal of Social Psychology*, Vol.40, No.6, 998-1009.
- Maslow, A. H. (1943) A theory of human motivation. *Psychological Review*, Vol.50, No.4, 370-396.
- Merton, R. K. (1973) *The Sociology of Science: Theoretical and Empirical Investigations*, Chicago and London, The University of Chicago Press
- Moser S.C. (2007) In the long shadows of inaction: the quiet building of a climate protection movement in the United States, *Global Environmental Politics*, Vol.7, No.2, 124-144.
- Oliver, C. (1991) Strategic responses to institutional processes. *Academy Management Review*, Vol.16, 145-179.
- Parasuraman A., Colby C.L. (2001) *Techno-Ready Marketing: How and Why Your Customers Adopt Technology*, New York, Free Press.
- Pèrez Pèrez M., Sánchez A.M., Carnicer P.L., Jiménez M.J.V. (2004) A technology acceptance model of innovation adoption: the case of teleworking, *European Journal of Innovation Management*, Vol.7, No.4, 280-291.
- Polanyi M. (1958) *Personal Knowledge, Towards a Post-Critical Philosophy*, London, Routledge
- Popper (1966) *Objective Knowledge, A realist view of logic, Physics and History*, Revised edition 1972, Oxford, Oxford University Press,.
- Quarantelli E.L. (a cura di) (2005) *What is a disaster?: a dozen perspectives on the question*, London & New York, Routledge
- Rainero C., Modarelli G. (2019) From Blockchain to Bitcoin and Beyond: A Social Learning Approach, in Culasso F. & Pizzo M. *Proceedings XXXIX National Conference AIDEA 2019*, Turin, Collane@unito.it, 260-273.
- Ram S. (1987) A Model of Innovation Resistance, in NA – Advances in consumer research, Vol.14, eds. Melanie Wallendorf and Paul Anderson, Provo, UT: Association for consumer research, 208-212.
- Rasmussen E., Corbett G. (2008) Why Isn't Teleworking Working?, *New Zealand Journal of Employment Relations*, Vol.33, No.2, 20-32.
- Rayner J., Espinoza D. E. (2016) Emotional labour under public management reform: an exploratory study of school teachers in England, *The International Journal of Human Resource Management*, Vol.27, No.19, 2254-2274.
- Recommendations to The European Council (1993) *Europe and the Global Information Society*, Brussels
- Rogers E.M. (1962) *Diffusion of Innovations*, New York, Free Press Macmillan Company
- Sangster A. (2016) The Genesis of Double Entry Bookkeeping, *The Accounting Review*, Vol.91, No. 1,299-315
- Sarti D., Torre T. (2017) Is smart working a win-win solution? First Evidence from the Field, in T. Addabbo, E. Ales, Y. Curzi, I.Senatori, *Well-being at and Through Work*, Torino, Giappichelli

- Shin B., Sheng O., Higa K. (2000) Telework: existing research and future directions, *Journal of Organizational Computing and Electronic Commerce*, Vol.10, No.2, 85-101.
- Song Y. (2014) Bring Your Own Device (BYOD) for seamless science inquiry in a primary school, *Computers & Education*, Vol.74, 50-60.
- Torre T. (2015) Tutto è smart...anche il lavoro, *Impresa Progetto Electronic Journal of Management*, Vol.3, 1-10.
- Torre T. (2020) Smart Working: Soluzione ad ogni emergenza? Prospettive oltre l'emergenza, *Impresa Progetto Electronic Journal of Management*, Vol.1, 1-11.
- Venkatesh V., Bala, H. (2008), Technology Acceptance Model 3 and a Research Agenda on Interventions, *Decision Sciences*, Vol.39, 273-315.
- Venkatesh V., Davis F. (2000) A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, Vol.46, No.2, 186-204.
- Venkatesh V., Davis, F.D. (1996) A Model of the Antecedents of Perceived Ease of Use: Development and Test, *Decision Sciences*, Vol.27, 451-481.
- Venkatesh V., Morris M., Davis G., Davis, F. (2003) User Acceptance of Information Technology: Toward a Unified View, *MIS Quarterly*, Vol.27, No.3, 425-478.