

ADOPTING TECHNOLOGY IN SPECIAL EDUCATION: A QUESTION OF VALUES

L'ADOZIONE DELLA TECNOLOGIA NELLA DIDATTICA SPECIALE: UNA QUESTIONE DI VALORI

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Abstract

Inclusion is configured as an action aimed at the realization of inclusive values which are guides and an impetus for the action itself. Many studies have shown that intrinsic motivation plays an important role in the adoption of technology in teaching and is essential for action aimed at valuing differences. Based on these considerations, the aim of the contribution is to trace the theoretical framework of a research project aimed at investigating the role of values and motivation of future support teachers in adopting technologies in teaching.

L'inclusione si configura come un'azione rivolta alla realizzazione di valori inclusivi che sono guide e un impulso per l'azione stessa. Molti studi hanno evidenziato che la motivazione intrinseca ha un ruolo importante nell'adozione della tecnologia in didattica ed è fondamentale per un agire teso alla valorizzazione delle differenze. Sulla base di tali considerazioni, l'obiettivo del contributo è quello di tracciare la cornice teorica di un progetto di ricerca volto ad indagare il ruolo dei valori e della motivazione dei futuri docenti di sostegno ad adottare le tecnologie in didattica.

Keywords

Values; motivation; inclusion; technologies.
Valori; motivazione; inclusion; tecnologie.

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Introduction

In the context of the School 4.0 Plan (Legislative Decree 161/2022), envisioned by the National Resilience Recovery Plan, and in Agenda 2030, the need to adopt innovative teaching that uses new technologies to address important challenges of the present and extends man beyond the finiteness of his body is highlighted (McLuhan, 1967). In fact, both the Profile of the Inclusive Teacher and the 2006 Recommendation highlight that one of the key competencies of teachers is digital competence (European Parliament and Council, 2006; EU-Agency, 2012; European Council, 2014; Punie & Redecker, 2017). "Knowing how to use technologies" is identified as one of the pedagogical competencies to be improved in teacher education, moreover, it is made explicit how digital competence is necessary for the purposes of adopting "effective approaches in heterogeneous classrooms" for inclusive teaching (EU-Agency, 2012, p. 19). While the OECD (2019) survey indeed notes a high need for skills in teachers' instructional use of ICT, the acceptance of ICT in teaching is problematic (Berrett, Murphy & Sullivan, 2012). In line with the foregoing, many studies point out that the introduction of technologies and various innovative teaching models are conditioned by teachers' acceptance and motivation to use digital tools (Venkatesh et al., 2003, Radova & Kristal, 2017). The current mirror, therefore, is characterized by a gap between national initiatives that incentivize the diffusion of new information technologies and the low use in professional practice of digital tools (Benigno et al, 2013; Gui, 2010; Muscarà, Messina, 2015). The factors involved in the gap are extrinsic and intrinsic (Tezci, 2011). In this contribution, attention will be focused on the intrinsic variables, which, as highlighted in the literature, are the attitudes, motivations, and beliefs regarding the effects that the use of technology can contribute in the teaching-learning interaction (Compeau & Higgins 1995; Venkatesh, Morris, Davis, & Davis, 2003). Building on the previous reflections, the aim of the following paper is to outline the theoretical framework of a research project aimed at investigating the role of values and motivation of future support teachers to adopt technology in teaching. The paper will review the models used to study and investigate motivation to adopt technologies in didactics and, considering the centrality of values in the context of motivation to act, focus on the importance of adopting a theoretical framework that contemplates the values framework in relation to the motivation of future teachers.

The role of teacher values and motivation in the field of technology in education

In order to foster a culture of inclusion the role of the teacher in implementing practices aimed at fostering equitable education for all (Sibilio, 2020; Aiello & Pace, 2020; Ferraris, 2021; EASDNE, 2012) turns out to be pivotal. Practices that are structured in interaction with the environment, from this interaction motivational phenomena arise, (Lewin, 1936; Murray, 1938), so as the environment changes, new needs, new motivations arise. One of these is the use of technology in a society that requires actions directed toward valuing the differences and peculiarities of learners, in this sense technologies have infinite potential in promoting an equitable and inclusive society (EU-Agency, 2012; Marion, 2020; Di Tore, 2022). In the school and training context, as anticipated, the discriminating element is the personal factors of those who use digital tools. Many longitudinal and cross-sectional studies have shown that altruistic and intrinsic value underlie motivation to engage in the profession and are also the best predictors for the integration of technology into education (Cullen & Green, 2011; Pierson, 2001). In addition, there are various evidences on the relationship between intrinsic motivation, which is the internal drive: to commit to an active, to self-regulation, to task persistence, and to enjoyment of work (Deci & Ryan, 2008; Deci & Vansteenkiste, 2004).

As Watt & Richardson (2007) point out, the construct of motivation is multidimensional and complex; in fact, there are several theories that have attempted to disambiguate its various aspects. According to the theories of John William Atkinson and Victor Harold Vroom, expectancy is an individual's belief that a certain effort will lead to the achievement of a certain goal. This, combined with valence, i.e., the value a person assigns to the reward he or she will obtain as a result of his or her behavior and work, result in motivation. In other words, "potential outcomes from one's actions are motivationally effective only if they are both attainable and attractive" (Rheinberg, 2004, p. 79).

In the Index for Inclusion (Booth and Ainscow, 2014) and expectancy-value theory (Atkinson, 1957; Vroom, 1964; Eccles & Wigfield, 2002), among the internal variables a central role is played by values. Values have been defined by both Booth and Ainscow (2014) and Colicchi (2021) as something that directs and "pushes" human behaviors in a direction, in fact on the part of the agent there is a responsibility for behavior, moved by conviction about the goodness of something and as such it generates purposes. Thus, the assumption of responsibility, in the context of reflection on the investigation of the role of values in education, is an important feature since it legitimizes the researcher to ask the person to justify his or her behavior (Colicchi, 2021). In other words, value is "a belief, held by one or more persons, concerning the goodness - in the sense of appreciability, desirability or desirability - of something" (Colicchi, 2021, p. 242). From these premises, the qualitative and quantitative weight of values in the motivation to act can be hypothesized. In the literature, however, there is a dearth of studies investigating the motivation to integrate technologies in relation to values.

Specifically, there are many models that theorize the relationship between internal disposition toward ICT (Information and Communication Technology) and concrete use, the substrate of most studies is inspired by the principles of the Theory of Reasoned Action (TRA - Theory of Reasoned Action, Fishbein and Ajzen, 1975) and the Theory of Planned Behavior (TPB). In the Technology Acceptance Model (1989, TAM) paradigm, which stems from the Theory of Reasoned Action (Ajzen & Fishbein, 1975), Davis (1992) identified the construct of Perceived Usefulness as the ability to use technology to improve performance and the Perceived Ease of Use as the degree of ease with which the digital tool is used. From the factor analysis model, adopted by Davis (1992), it appears that behavioral intentions would seem to be a main predictor in technology use, followed by perceived usefulness; in contrast, perceived ease of use would emerge as a secondary factor. Vallerand, 1997, building on TAM, theorizes motivation theory by pointing out that technology adoption is conditioned by both extrinsic motivation, whereby technology is used because it is a tool to achieve a goal, and intrinsic motivation. In conclusion, studies that have adopted the Technology Acceptance model (Bagozzi, 1992; Venkatesh, 2003) have found a positive correlation between perceived usefulness and perceived ease of use of digital tools and the degree of openness and willingness to adopt ICT; on the other hand, the teacher who perceives low control and poor management of the benefits produced by the tool will be less likely to use ICT. Additional factors affecting technology adoption may be: age, it would seem that as people get older they perceive themselves as less competent in using ICT and have greater beliefs and perceptions with respect to the non-usefulness of digital tools in improving professional performance (Muscarà, 2015); gender, as in many studies males would seem to be more likely to use technologies perceiving themselves as more competent (Muscarà, 2015; Teczi, 2011); professional qualification, and post-graduate degrees; in fact, teachers who have the aforementioned degrees manifest a high perception of self-efficacy (Self-efficacy) and expectation that their actions will produce the desired effect (Outcome Expectation) (Muscarà, 2015).

Considering the relevant literature, the use of ICT in the school context may correspond to the adoption of the tool as an accessory in professional practice, but not to exploit its full potential (Sibilio, 2020). As pointed out by Deci & Ryan (2001), the discriminating element to be studied and investigated is the teacher's intrinsic and extrinsic motivation to use technologies in their professional practice. The term motivation refers to "enduring predispositions that arouse and direct behavior toward certain goals (Engel, Blackwell & Miniard 1995, p. 9). Extrinsic motivated behavior is driven by instrumental value. In the context of technology adoption, the terms used to refer to extrinsic motivation are "perceived usefulness" and "perceived ease-of-use" (Van der Heijden, 2004). In contrast, intrinsic motivation is conceptualized as the "doing an activity for the inherent satisfaction of the activity itself" (Ryan and Deci, 2000, p. 71). Behavior motivated by intrinsic factors is self-determined, volitional, and on the part of the teacher a high level of interest is manifested. The value is in the appreciation of the activity and not derived from a secondary goal, and the behavior is driven by the need for competence and autonomy and by emotions such as enjoyment and excitement. In fact in the context of technologies, intrinsic motivation can be investigated by detecting the belief "perceived enjoyment" (Davis et al, 1992; Van der Heijden, 2004; Wakefield and Whitten, 2006). Yoo et al (2012) studied the impact of intrinsic and extrinsic motivation in e-learning use, and they theorized that intrinsic motivation includes effort expectancy, instead, the components of extrinsic motivation are performance expectancy, social influences, and facilitating conditions.

In further studies, the model most widely adopted in research aimed at understanding how to incentivize the adoption of technology in teaching practice is the Social Cognitive Career Theory (SCCT; Lent, Brown & Hackett, 1994) adapted in the context of ICT by Compeau & Higgins, 1995. Bandura and various social-cognitivist theories argue that people structure beliefs based on past experiences, specifically teachers tend to persist in activities in which they perceive themselves to be most effective.

Compeau and Higgins (1995), adopting Social Cognitive Theory of computer utilization identified the following reference constructs: Outcome Expectations/Performance, which is concerned with the perceived consequences of ICT use on job performance and Outcome Expectations/Personal, which is the perceived consequences on a personal level, in terms of self-esteem and success in achieving one or more goals; Self-Efficacy, or judgment of one's ability to use one or more technological tools to achieve a given job goal; Affect or emotion underlying the use of ICT; and finally the level of Anxiety emotional reaction related to the performance of using a computer or other technological tools.

Smith (2002) confirmed the predictive influence of self-efficacy and outcome expectation in the growth of interest in using information technology. With the aim of bringing together the main internal variables affecting the integration of ICT in pedagogical practice into a single measurement tool. Niederhauser and Perkmen (2008) developed and verified a measurement model that operationalizes the correlated constructs of Self-efficacy, Outcome expectation, Interest and behavioral intentions in technology use (Intrapersonal Technology Integration Scale). Cullen & Greene (2011) also investigated prospective teachers' motivation in adopting technology in the classroom, the related construct being the Theory of Planned Behavior (TPB) and Self-Determination Theory, noting that positive and negative attitudes are best for understanding intrinsic motivation, while only positive attitudes were useful in predicting extrinsic motivation.

The presence of many constructs led a group of scholars to develop a multifactorial theoretical model that encompasses the various theories, Venkatesh et al. (2003) theorizes the Unified Theory of Acceptance and Use of Technology (UTAUT) which arises of the TPB, TRA, MM (motivational model), TAM, and SCT. The UTAUT model aims to explain intentions to use technology and to predict actual decisions and behaviours with respect to its use. The model conceptualizes four dimensions determining use intentions, which are: performance expectancy, effort expectancy, social influence and facilitating conditions. It should also be pointed out that the variables of sex, age, experience, and voluntariness of use mediate the impact of the four basic dimensions on intention to use and behaviours. The UTAUT model has been adopted in the Italian context (Rossi et al, 2018) but has not yet been declined in the educational setting and there is no validated version of the questionnaire. The UTAUT questionnaire in the original version by Venkatesh, Morris, Davis, and Davis (2003) consists of 31 items and investigates 8 constructs, based on the Unified Theory of Acceptance and Use of Technology (UTAUT), Performance Expectancy (PE), Expectancy of Difficulty (EE), Attitude to Use of Technology (ATUT), Social Influence (SI), Facilitating Conditions (FC), and Self-Efficacy (SE). The Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. shows higher construct validity than the models previously exhibited and reasonably predicted teachers' use intentions (Birch and Irvine, 2009).

The limitation of this study as well as others investigating the object under consideration is the use of an instrument that does not contemplate the multifactorial nature of motivation to use technology in education, considering the role of values as crucial in guiding action, and furthermore.

Watt and Richardson (2007) adopted the expectancy-value theory and Socio-cognitive career theory to investigate motivation to choose the profession, noting how wanting to contribute to social equity falls squarely within the altruistic values that can motivate a person to choose the teaching profession and pursue education. The latter is crucial for the acquisition of those educational-didactic knowledge aimed at addressing the peculiarities of the educational needs manifested by children and pupils with disabilities (Legislative Decree No. 66/2017; EADSNE, 2012; WHO, 2011).

Thus, taking the expectancy-value theory (Eccles and Wigfield, 2022), and declining it in the context of factors affecting motivation to adopt technologies in education, the quality and magnitude of value affect the motivation to act (Dörnyei & Ushioda, 2011), and action results as a realization of the magnitude of the values themselves. In other words, adopting ICT in the classroom because one is driven by the value of social utility can assume that the teacher is motivated to act in support of inclusion.

Conclusion

The technologies, in educational interaction, make it possible to implement the constitutional principle of the right to education (Sibilio, 2020), and do so in a space-time different from traditional didactics. Technology, in the context of special education, is the only landing place to ensure the personalization of teaching and the enhancement of human potential as well as the development and utilization of everyone's different abilities (Sibilio, 2020). Thus, the use of technology in special education requires a value framework on the part of the teacher aimed at using technology for inclusive purposes.

Motivation, then, creates innovation and contributes to overcoming obstacles, making us achieve results. The road of innovation and values meet toward an ultimate file, that is, both are striving toward change. As pointed out in the Index for Inclusion, values are "fundamental guides and an impetus for action" and "inclusion is shaped as action directed toward the realization of inclusive values," in this sense a circularity between values and inclusive actions is detected, giving a central role to the teacher "to overcome exclusion and promote participation" (Booth & Ainscow, 2014, p. 49). Specifically, among the essential prerequisites of innovation in special education is "the presence of a guiding motive for people, that is, an intrinsic motivation to act" (Amabile & Pratt, 2016; Zurru, 2022, p. 6), guided by values aimed at inclusion. As Zurru (2022) concludes: it is necessary to train the main actors so that, through the full development of their personal and professional identities, they take on innovation as a valuable perspective, autonomizing, empowering and promoting development, collaboration and interaction" (p. 181), to do this we need to circumscribe the intrinsic variables and their weight in the motivational and value aspects of people working to promote an equitable and inclusive society (Agenda, 2030). For this reason, a longitudinal project involving future support teachers is envisaged, in which the UTUAT instrument will be used, since it is multi-factorial, and a structured interview according to the expectancy-value theory prepared to detect the value framework of future teachers in relation to the use of ICT in teaching. The choice of a mixed-method approach should respond to the complexity of the survey object.

References

- Aiello, P., & Pace, E. M. (2020). *Inclusive educational principles, policies, and practices in Italy*. In Oxford Research Encyclopedia of Education.
- Ajzen, I., & Fishbein, M. (1975). A Bayesian analysis of attribution processes. *Psychological bulletin*, 82(2), 261.
- Amabile T. M., & Pratt M. G. (2016). The dynamic componential model of creativity and innovation in organizations: Making progress, making meaning. *Research in Organizational Behavior*, 36: 157-183. Doi: 10.1016/j.riob.2016.10.001.
- Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological review*, 64(6p1), 359.
- Bagozzi R.P., Davis F.D., & Warshaw P.R. (1992). Development and test of a theory of technological learning and usage. *Human Relation*, 45(7), pp. 660-686.
- Benigno V., Chiorri C., Chifari A., & Manca S. (2013). Adattamento italiano della Intrapersonal Technology Integration Scale. Uno strumento per misurare gli atteggiamenti degli insegnanti nei confronti delle ICT. *Giornale italiano di psicologia*, XL(4), pp. 815-835
- Berrett, B., Murphy, J., & Sullivan, J. (2012). Administrator insights and reflections: Technology integration in schools. *The Qualitative Report*, 17(1), 200-221. <https://doi.org/10.46743/2160-3715/2012.1815>
- Birch A., Irvine V. (2009), "Preservice teachers' acceptance of ICT integration in the classroom: applying the UTAUT model", *Educational media international*, 46(4): 295-315
- Booth, T., Ainscow, M., & Dovigo, F. (2014). *Nuovo Index per l'inclusione: percorsi di apprendimento e partecipazione a scuola*. Carocci.
- Colicchi, E. (2021), *I valori in educazione e in pedagogia*, Carocci Editore: Roma
- Compeau D.R., & Higgins C.A. (1995). Application of social cognitive theory to training for computer skills. *Information Systems Research*, 6(2), pp. 118-142
- Consiglio Europeo (2014). Council conclusions of 20 May 2014 on effective teacher education. Retrieved from [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XG0614\(05\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XG0614(05)&from=EN)
- Cullen, T. A., & Greene, B. A. (2011). Preservice teachers' beliefs, attitudes, and motivation about technology integration. *Journal of Educational Computing Research*, 45(1), 29-47.
- Davis F.D., Bagozzi R.P., & Warshaw, P.R. (1989). User Acceptance of Computer Technology: A comparison of two Theoretical Models. *Management Science*, 35(8), pp. 982-1002.
- Davis F.D., Bagozzi R.P., & Warshaw, P.R. (1992), Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of applied social psychology*, 22(14), pp. 319-339
- Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian psychology/Psychologie canadienne*, 49(3), 182.

- Di Tore, S. (2022), Dal metaverso alla stampa 3D: Prospettive semplesse della didattica innovativa. Roma Studium edizioni ISBN:978-88-382-5270-9
- Dörnyei, Z., & Ushioda, E. (2011). Teaching and researching motivation (2nd ed.). Harlow, England: Pearson Longman
- Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual review of psychology*, 53(1), 109-132.
- Engel, J.F., Blackwell, R.D. and Miniard, P.W. (1995). *Consumer Behavior*. The Dryden Press, Forth Worth, Texas.
- European Agency for Special Needs and Inclusive Education (EASNIE) (2012). *Teacher education for inclusion. Profile of inclusive teachers*. Estratto da: <https://www.european-agency.org>
- Ferraris, M. (2021). *Post Colonial Studies*. Giulio Einaudi Editore: Torino.
- Gui, M. (2010). L'uso didattico delle ICT. In A. Cavalli, G. Argentin (Eds.), *Gli in-segnanti italiani: come cambia il modo di fare scuola. Terza indagine dell'IstitutoIARD sulle condizioni di vita e di lavoro degli insegnanti italiani* (pp. 1-17).Bologna: Il Mulino
- Lent R.W., Brown S.D., & Hackett G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior*, 45, pp. 79-121
- Lewin, K. (1936). A dynamic theory of personality: Selected papers. *The Journal of Nervous and Mental Disease*, 84(5), 612-613.
- McLuhan, M., & Fiore, Q. (1967). The medium is the message. *New York*, 123(1), 126-128.
- Murray, H. A. (1938). Explorations in personality: A clinical and experimental study of fifty men of college age.
- Muscarà, M., & Messina, R. (2015). Perceived competency, perceived ICT usefulness in classroom and teachers training models. *ITALIAN JOURNAL OF EDUCATIONAL RESEARCH*, (13), 181-196. Retrieved from <https://ojs.pensamultimedia.it/index.php>
- OCSE (2019). TALIS 2018 Results (Vol. 1): Teachers and School Leaders as Lifelong Learners. Paris, FR: OECD Publishing
- Parlamento Europeo e Consiglio (2006). Raccomandazione del Parlamento Europeo e del Consiglio del 18 dicembre 2006 relativa a competenze chiave per l'apprendimento permanente. Retrieved from <https://eur-lex.europa.eu/legalcontent/EN/TXT/HTML/?uri=CELEX:32006H0962&from=EN>
- Piano Nazionale di Ripresa e Resilienza – Next Generation EUItalia-30 aprile 2021 disponibile: <https://www.governo.it/sites/governo.it/files/PNRR.pdf>
- Pierson, M. E. (2001). Technology integration practice as a function of pedagogical expertise. *Journal of research on computing in education*, 33(4), 413-430.
- Punie, Y., & Redecker, C. (2017). European framework for the digital competence of educators: DigCompEdu. Luxembourg, LU: Publications Office of the European Union.
- Radovan M., Kristl N. (2017), “Acceptance of Technology and Its Impact on Teachers’ Activities in Virtual Classroom: Integrating UTAUT and CoI into a Combined Model”, *Turkish Online Journal of Educational Technology-TOJET*, 16(3): 11-22.
- Rheinberg, F. (2006), *Valutare la motivazione. Strumenti per l'analisi dei processi motivazionali*. Il Mulino: Bologna
- Ryan, R.M. and Deci, E.L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.
- Ryan, R.M. and Deci, E.L. (2000b). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54-67.
- Sibilio, M. (2020). *L'interazione didattica*. Brescia: Scholé.
- Smith S. (2002). Using the social cognitive model to explain vocational interest in information technology. *Information Technology, Learning, and Performance Journal*, 20(1), pp. 56-65
- Tezci E. (2011). Factors that influence pre-service teacher's ICT usage in education. *European Journal of Teacher Education*, 34(4), pp. 483-499
- UN. United Nations (2020). The Sustainable Development Goals Report 2020. <https://unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf> (ver. 15.04.2021).
- Van der Heijden, H. (2004). User acceptance of hedonic information systems. *MIS Quarterly*, 28(4), 695-704.
- Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K. M., & Deci, E. L. (2004). Motivating learning, performance, and persistence: the synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of personality and social psychology*, 87(2), 246.
- Venkatesh V., Morris M.G., Davis G.B., Davis F.D. (2003), “User acceptance of information technology: Toward a unified view”, *MIS quarterly*, 27(3): 425-478.
- Verhagen, T., Feldberg, F., Van Den Hooff, B., & Meents, S. (2009, June). Understanding virtual world usage: A multipurpose model and empirical testing. In *ECIS* (pp. 761-775).
- Vroom, V.H. (1964), *Work and Motivation*, John Wiley and Sons, New York, NY.
- Watt, H. M., & Richardson, P. W. (2007). Motivational factors influencing teaching as a career choice: Development and validation of the FIT-Choice scale. *The Journal of experimental education*, 75(3), 167-202.
- WHO. World Health Organization (2011). *World Report on Disability*. Geneva: World Health Organization.
- Zurru, A. L. (2022). In che senso è possibile innovare a scuola attraverso la Didattica Speciale?. *Education Sciences & Society-Open Access*, 13(2).