EXPLORING PRE-SERVICE TEACHERS' PERSONAL EPISTEMOLOGIES ABOUT FLIPPED INCLUSION MODEL: A QUANTITATIVE RESEARCH STUDY

ESPLORARE LE EPISTEMOLOGIE PERSONALI DEGLI INSEGNANTI PRE-SERVIZIO IN RELAZIONE AL MODELLO FLIPPED INCLUSION: UNO STUDIO DI RICERCA QUANTITATIVO

Annalisa lanniello Università degli Studi di Salerno aianniello@unisa.it



Ali Musleh Alodat Yarmouk University ali.alodat@yu.edu.jo



Tonia De Giuseppe
Università Giustino Fortunato
t.degiuseppe@unifortunato.eu



Felice Corona
Università degli Studi di Salerno
fcorona@unisa.it



Double Blind Peer Review

Citazione

Ianniello A., Alodat A.M., De Giuseppe T., Corona F., (2023) Exploring pre-service teachers personal epistomologies about flipped inclusion model: a quantitative reseach study, Giornale Italiano di Educazione alla Salute, Sport e Didattica Inclusiva - Italian Journal of Heating Education, Sports and Inclusive Didactics. Anno 7, V 2. Edizioni Universitarie Romane

Doi:

https://doi.org/10.32043/gsd.v7i2.878

Copyright notice:

© 2023 this is an open access, peer-reviewed article published by Open Journal System and distributed under the terms of the Creative Commons Attribution 4.0 International, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

gsdjournal.it ISSN: 2532-3296

ISBN: 978-88-6022-470-5

ABSTRACT

Personal epistemologies, definable as the latent personal belief system, are implicated in teaching-learning processes. These implicit assumptions influence decisions and pedagogical practices (Hofer & Pintrich, 2001) considered privileged components in the investigation of teaching practice (Di Tore, 2022).

In this regard, this study aims to detect the personal epistemologies of pre-service teachers concerning the concept of Inclusion in relation to the innovative model of active teaching Flipped Inclusion, under experimentation at the University of Salerno since 2014.

Le epistemologie personali, definibili come il sistema di credenze personali latenti, sono implicate nei processi di insegnamento-apprendimento. Tali assunzioni implicite influenzano le decisioni e le pratiche pedagogiche (Hofer & Pintrich, 2001) considerate componenti privilegiate nell'indagine della pratica didattica (Di Tore, 2022).

A tal proposito, questo studio mira a rilevare le epistemologie personali dei docenti pre-servizio riguardanti il concetto di Inclusione in relazione al modello innovativo di didattica attiva Flipped Inclusion, in sperimentazione presso l'Università degli Studi di Salerno dal 2014.

KEYWORDS

Inclusion; Pre-Service Teachers; Personal Epistemologies; Flipped Inclusion.

Inclusione; Insegnanti Pre-Servizio; Epistemologie Personali; Flipped Inclusion.

Received 11/04/2023 Accepted 11/05/2023 Published 20/05/2023

Introduction

Personal Epistemology Research: Implications for Learning and Teaching

Tacit knowledge influences perceptions, values, attitudes, and behaviours of individuals. According to Briscoe, personal experiences and subsequent beliefs about knowledge predispose us to pay attention to specific data, attribute meaning, and draw conclusions (Briscoe, 2015).

The term Personal Epistemology describes latent beliefs "about how knowing occurs, what counts as knowledge and where it resides, and how knowledge is constructed and evaluated" (Hofer, 2004, p.1).

Personal epistemology (EP) refers to beliefs about knowing and knowledge at the individual level (Hofer, 2005); is a term used to identify a person's beliefs regarding the complexity of learning and knowledge, processes of knowing, sources for knowledge, and justification of knowledge claims (Hofer & Sinatra, 2010; Marra & Palmer, 2008).

Kitchener (2002) described personal epistemological beliefs as "folk epistemology" or an individual's "untutored" views about the nature of knowledge (p. 89). Hofer (2005) defined personal epistemology as "an identifiable set of dimensions of beliefs about knowledge and knowing, organised as theories, progressing in reasonably predictable directions, activated in context, operating both cognitively and metacognitively" (p. 98). The author described personal epistemological beliefs as an interconnected multidimensional system, composed of 2 core dimensions, the nature of knowledge (what is believed to be knowledge) and the nature of knowing (how to get knowledge) to which two subdimensions pertain each (certainity of knowledge and simplicity of knowledge; source of knowing and justification of knowing) (Fig. 1).

CORE DIMENSIONS

NATURE OF KNOWLEDGE

Certainty of Knowledge

Degree to which one views knowledge as certain; for example, absolute truth to one knowledge that is tentative and evolving (Schommer, 1990)

Simplicity of Knowledge	Knowledge that may be seen as an accumulation of facts to knowledge that is consisted of highly interrelated concepts (Schommer, 1990)
NATURE OF KNOWING	
Source of Knowing	This may be seen as knowledge that originates outside the self and residing in external authority, or it may be perceived as knowledge that is constructed by the individual in his/her interaction with the environment and others (Baxter Magolda, 1992)
Justification for Knowing	This is referred to how individuals evaluate knowledge claims, including the use of evidence, the use they make of authority and expertise, and their evaluation of experts (Hofer & Pintrich, 1997)

Fig. 1 Component of epistemological beliefs (Phan, 2008).

Knowledge beliefs influence the teaching-learning process. The domain of personal epistemology conditions a series of aspects of educational and didactic practices: it can facilitate and limit cognition, motivation, and the construction of meaningful learning (Pintrich, 2002). For Nespor (1987), epistemic beliefs are a predictor of teacher behaviour. At the same time, the education and training of individuals influences personal epistemology (Hofer, 2004; King, & Kitchener, 2004). In this sense, the detection of teachers' personal epistemologies is configured as a pedagogical imperative both to establish awareness processes and to improve preservice teacher training, will become responsible for the knowledge and knowing of others, of the construction of inclusive people and contexts (Giaconi, 2015).

1.1. An Analysis of Teachers' Personal Epistemologies for Inclusive Education

The research of the last thirty years has mainly focused on students' personal epistemology (Bendixen & Feucht, 2010), focusing on implicit beliefs related to teaching and learning (Ertmer, 2005; Kane, Sandretto & Heath, 2002). However, teachers' personal epistemologies can also influence the learning process (Bråten, 2010) (Fig. 2).

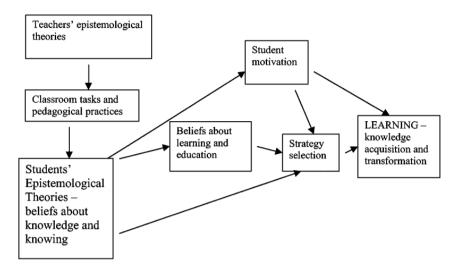


Fig. 2. Working model of how epistemological theories influence classroom learning (Hofer, 2001).

Research on personal epistemology demonstrates that teachers' beliefs about knowledge and how knowledge is acquired influence their practice. This influence is affected by how teachers conceive of what is good practice, what influences those conceptions, and how they differ with respect to context and people (Aiello et. al, 2023). Recognizing a link between personal epistemology and teaching practice is important for identifying how the different implicit beliefs of teachers influence curricular planning, pedagogical and teaching choices.

In examining the personal epistemologies of in-service teachers, many studies have demonstrated that a coherence existed between personal epistemology and teaching practices. Howard, McGee, Schwartz & Purcell (2000) summarized the impact of teachers' latent beliefs on their practice. Teacher epistemology has been shown to influence: 1) the use of teaching strategies (Hashweh, 1996); 2) the use of problem solving approaches (Martens, 1992); 3) their efforts in curriculum adaptation (Prawat, 1992); 4) the use and choice of textbooks; 5) their openness to students' different perspectives (Hashweh, 1996); 6) their students' reading practices (Anders & Evans, 1994); 5) the use of students' higher-level thinking skills (Maor & Taylor, 1995) (p. 1).

Implicit beliefs of teachers about students and about learning also influence their interactions in the classroom (Soodak & Podell, 1994), which are fundamental for promoting equal participation and activating inclusive processes. For Stark (2002) they condition the teacher's expectations and identity, as they strongly influence

the way they carry out their professional roles and socialize in communities of practice.

Research has demonstrated the ontological relationship between beliefs and instructional action (Nespor, 1987), as well as a correlation between teachers' epistemological beliefs, critical thinking, and decision making (Lawrence, 2015; Marra & Palmer, 2008; McMillan, 2010). The cognitive processes involved in critical systems thinking and decision-making are therefore also motivated by teachers' personal beliefs about knowledge (where knowledge comes from, what constitutes knowledge, and how knowledge is developed) (Hofer, 2006). Hofer (2000), Weinstock & Roth (2011) found that awareness of teachers' personal epistemologies correlates positively with teacher perspective-taking skills and with giving students greater autonomy.

Muis (2004) highlighted that teachers' epistemological beliefs are powerful predictors of students' learning methods and achievements. Teachers have beliefs about their ability to influence student performance, perceptions of self, feelings of self-worth, and ability to perform certain specific tasks or disciplines. In this sense, some beliefs may even be incompatible with inclusive and effective teaching practices, as well as compromise student success (Jordan, Lindsay, & Stanovich, 1997; Stipek & Byler, 1997). In this regard, Hativa & Goodyear (2002, p.353) underline the need for teachers to: 1) be aware of what drives their current vision of teaching and therefore their practice; 2) be exposed to alternative conceptions of teaching and learning to promote reflection on one's own experience and that of others; 3) make one's implicit beliefs explicit.

Scientific studies have explored how such latent beliefs influence strategies and learning outcomes of pre-service teachers as well, including how they interpret innovative teaching practices, models, and methodologies (Yadav & Koehler, 2007; Bronwlee & Berthelsen, 2006). They showed roughly consistent results: pre-service teachers still had a traditional view of teaching and learning (Cheng et al., 2009), while using teaching strategies flexibly and cultivating positive relationships with their students (Schraw & Sinatra, 2004).

1. 2. Flipped Inclusion: An Active Learning Approach

In this sense, it was decided to investigate the implicit assumptions of pre-service teachers in training regarding the concept of inclusion in relation to innovative teaching models (Corona et.al, 2022). In this regard, the Flipped Inclusion existential design model, being tested at the University of Salerno since 2014 (De Giuseppe et.al, 2020), through an upside-down didactic action of cooperative

interdependence (Sibilio, 2023), aims to promote the construction of prosocial-inclusive people and contexts. The investment line aims to create lifelong learning, increase the development of skills (also digital) with the help of interactive tools, making the learning process more motivating and improving the atmosphere in the classroom (D'Alonzo, 2020). Research data from 1822 participants with a simple random sampling of 911 people confirm the transformative impact of the Flipped Inclusion model on cognitive and attributional styles (Corona et. al., 2020). However, no previous research has analysed the personal epistemologies of teachers relating to the concept of inclusion in relation to the FI model, nor the latent opinions (positive, negative, or neutral) relating to its application.

2. Materials and Methods

The aim of this study is to investigate the personal epistemologies of pre-service teachers regarding the concept of Inclusion in relation to the application of the Flipped Inclusion model. Given the objective, to investigate the implicit and hidden assumptions of the participants - difficult to detect with traditional tools - the use of Artificial Intelligence, Machine Learning and Text Mining techniques was adopted. Given that the explicit statements of teachers don't always coincide with the implicit assumptions on the nature of learning and the inclusive process, these tools make it possible to circumvent the potential biases that reside mainly in the willingness of future teachers to adhere to the most accredited theoretical frameworks. The software chosen for the analysis is Orange 3.0, an open-source machine learning and data visualization tool (Di Tore, 2022).

The sample size includes a group of 498 pre-service teachers (=390 females/=108 males). The technique of simple random sampling was used to construct the population for this study. Participants were selected from the Specialization Course for teachers in training from different schools at different levels ranging from nursery to higher secondary schools (Preschool, Primary, Lower Secondary and Upper Secondary). Through GoogleForms, an app for creating surveys included in the Google Drive office suite, pre-service teachers were asked to produce a written text regarding the advantages and disadvantages of the Flipped Inclusion model. All the participants signed the informed consent form and they were assured of respect for their privacy. As graphically represented below, each participant provided a series of socio-demographic information: gender, age, province of origin.

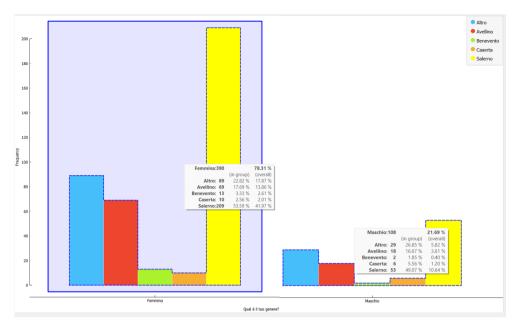


Fig. 3 Gender and Province of the participants.

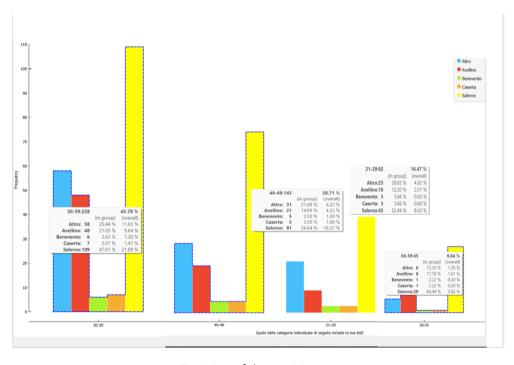


Fig. 4 Age of the participants.

2.1. Tool - Test-Mining and Latent Semantic Indexing (LSI)

Text Mining, known as knowledge discovery database from text, is an Artificial Intelligence technique that uses natural language processing to transform free and unstructured text data into processable, structured, and normalized data (Thakur & Kumar, 2021). The goal is to extract meaning, classify topics and assign them a polarity (Di Tore, 2022). In particular, Topic Modeling is a text mining technique that provides methods for identifying recurring word patterns, hidden semantic structures that characterize the set of unstructured textual data. Topic Modeling techniques make use of various algorithms to interpret text corpuses. The most suitable algorithm for the type of analysis to be proposed is Latent Semantic Indexing, due to its ability to retrieve and identify semantically correlated latent terms in a text collection.

Latent Semantic Indexing (LSI) is an indexing and information retrieval method that uses a mathematical technique called Singular Value Decomposition (SVD) aimed at discovering statistical co-occurrences of words that appear together in an unstructured text collection. LSI reduces a matrix to its constituent parts for simple and efficient calculations. When analyzing a string of words, LSI removes conjunctions, pronouns, and common verbs (also known as stop words), isolating the words that make up the main "content" of large datasets and finding the semantic relationships between them (Evangelopoulos, 2013). LSI's categorization accuracy allows the tool to be very tolerant of any typographical errors in the texts.

2.2 Scoring and Data Analysis

For data analysis, a workflow was created for the extraction of hidden topics in the corpus of documents produced by the participants (Fig. 5).

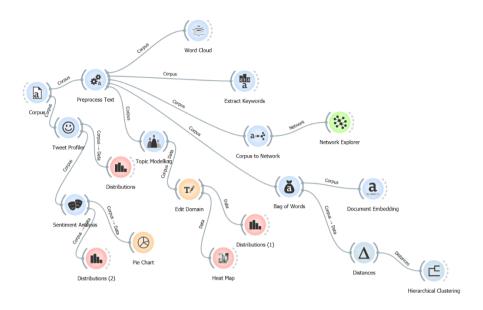


Fig. 5 Workflow for the extraction of hidden topics

The spreadsheet from GoogleForms forms was downloaded, imported into Orange 3.0, and pre-processed to remove stopwords. Subsequently, the texts were analyzed with Latent Semantic Indexing (LSI). The Word Cloud Widget (Fig. 6) was used to obtain an initial "weighted" graphical representation of the topics present in the corpus.





Fig. 6 Word Cloud Widget

For the identification of the key concepts, the corpus transforms into a network to highlight the thematic cores and the main relationships through the Corpus to Network widgets. Network Explorer widgets are used for displaying network graphs. The software locates several connected word networks (Fig. 7), where the thickness of the connecting lines is proportional to the number of links. Subsequently, the networks obtained by the Corpus to Network technique were

compared with the results of the Topic Modeling with Latent Semantic Index. The Topic Modeling Widget allows you to identify the thematic cores.

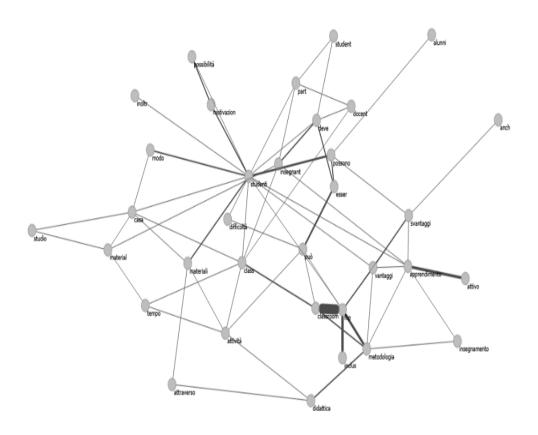


Fig. 7 Network Explorer Widgets

Finally, the texts are subjected to Sentiment Analysis, using the appropriate widget to systematically extract, quantify and study the affective states and subjective information. Sentiment Analysis identifies the emotional tone present in a text corpus. Identify and weigh terms semantically related to the six basic emotions identified by Paul Ekman (1999). Below, a graphical representation of the Sentiment Analysis results is proposed (Fig. 8).

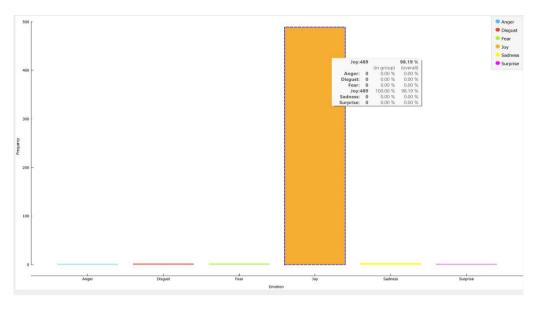


Fig. 8 Sentiment Analysis Graphical Output

3. Results

From the analysis of the data it is evident that, following the processing of unstructured texts with Latent Semantic Indexing (LSI) and the selection of 10 Topics, the following Keywords emerged more frequently: studenti (= 1073); flipped (= 916); apprendimento (= 752); casa (= 518); classroom (= 511); classe (= 506); metodologia (= 504); materiali (= 350); materiale (= 349); insegnante (= 346). In this sense, the results show a significant difference between the words "student" (= 1073) and "teacher" (= 346), probably because the personal epistemologies of pre-service teachers are directed towards the centrality of the pupil, active protagonist of the learning process (= 752). It can be assumed that this deviation refers to the reconfiguration of the relationship between teacher and student.

Furthermore, it can be deduced that the centrality of the student corresponds to attention towards the contents of the training (materials = 350), elements around which the interest of each actor involved in the training process converges, as well as attention towards the methodologies (= 504) used. The probable reconfiguration of the relationship between class work (= 506) and what takes place outside the class itself (home = 518) also emerges.

The main relationships between thematic cores are articulated around the concepts of "classroom" and "flipped", related by the thickest connecting line. Furthermore, although connected by a line of smaller width than the latter, the

concept of "inclusion" is still related to the concept of "flipped", which is in turn related to the concept of "methodologies". These reports show that the personal epistemologies of pre-service teachers associate the reversal of traditional teaching (flipped) with the possibility of promoting inclusion.

Finally, the results emerging from the Sentiment Analysis are particularly significant, reporting 98.19% of positive opinions (joy). This figure is certainly encouraging but, at the same time, indicative of a potential evaluation bias due to social desirability or something else (Paulhus, 1991). In this sense, further exploratory and confirmatory research will be needed in the future.

Conclusions and Recommendation

Teachers' explicit statements do not always coincide with implicit assumptions about the nature of learning and the inclusive process. In this sense, the analysis of unstructured corpora of texts produced by the participants was functional for the research of latent topics concerning the concept of inclusion in relation to the application of the innovative model of active teaching Flipped Inclusion. The implicit assumptions of the participating teachers positively correlate the model to the establishment of inclusive processes, guarantors of a quality, equitable and inclusive education (Bocci, 2021).

Teachers' personal epistemologies influence the teaching-learning process. Understanding and awareness of the latent and implicit assumptions of pre-service teachers can improve the teaching effectiveness of prospective teachers (Hofer, 2002). Therefore, it is essential to promote processes of conscientization on the nature of knowledge and on how to get to know, to stimulate the transition from naive beliefs to sophisticated beliefs (Hofer, 2001).

For teacher educators to be sensitive to their students' differing epistemological beliefs, they will need to become sensitive to their own. Research indicates that epistemological beliefs can change as a result of changes in the nature of education (Muis, 2004). In this sense, it is necessary that teacher educators offer opportunities for explicit reflection on teachers' personal epistemologies, for effective student learning (Windschitl, 2002; Phan, 2008). However, it is necessary to understand how teacher training courses could support the development of more sophisticated personal epistemologies to convey the construction of "a knowledge that allows you to explore multiple ways of knowing" (Brownlee, 2001). This trajectory is configured as a new viable research perspective.

References

Aiello, P., Pace, E. M., Sharma, U., Rangarajan, R., Sokal, L., May, F., Gonzalez Gil, F., Loreman, T., Malak, S., Martín, E., Mcilroy, A., Schwab, S. (2023). Identifying teachers' strengths to face COVID-19: narratives from across the globe *Cambridge Journal of Education*, 1-18.

Anders, P.L. & Evans, K.S. (1994). Relationship between teachers' beliefs and their instructional practice in reading. In R. Garner & P.A. Alexander (Eds.). Beliefs about text and instruction with text, 137–153. Hillsdale, NJ: Lawrence Erlbaum.

Bocci, F., Guerini, I., & Travaglini, A. (2021). Le competenze dell'insegnante inclusivo. Riflessioni sulla formazione iniziale tra aspettative e conferme. Form@ re, 21(1).

Bråten, I. & Strømsø, H. (2010). Effects of Task Instruction and Personal Epistemology on the Understanding of Multiple Texts About Climate Change. Discourse Processes. 47. 1-31.

Briscoe, P. (2015) Global systems thinking in education to end poverty: Systems leaders with a concerted push. International Studies in Educational Administration, 43(3), 5-19.

Brownlee, J., Berthelsen, J. (2006). Personal epistemology and relational pedagogy in early childhood teacher education programs, Early Years, 26:1, 17-29.

Campitiello, L., Arduini, G., Di Tore, A. (2022). Artificial Intelligence, Text Mining and Semantic Indexing in the Investigation of Teachers' Personal Epistemologies regarding the concept of Inclusion. *Italian Journal of Health Education, Sports and Inclusive Didactics*, 6 (1), 436-1.

Cheng, M. M., Chan, K. W., Tang, S. Y., & Cheng, A. Y. (2009). Pre-service teacher education students' epistemological beliefs and their conceptions of teaching. Teaching and Teacher Education, 25(2), 319-327.

Corona, F., De Giuseppe, T., Ianniello, A. (2020). The Flipped Inclusion Model: Eco-Sustainable and Inclusive Accessibility in the Era Covid-19. In: Agrati L.S. et al. (eds) Bridges and Mediation in Higher Distance Education. HELMeTO 2020. Communications in Computer and Information Science, vol 1344. Springer, Cham.

D'Alonzo, L. (2020). La gestione della classe per l'inclusione. Brescia: Scholè.

De Giuseppe, T., Ianniello, A., Corona, F. (2022). The New Construct of Well-Being in the Sars-Cov19 Era and GovernancePolicies Between System Dimensions in the Flipped Inclusion Model. *International Journal of Digital Literacy and Digital Competence*, 12 (1), 1-19.

Di Tore, P.A., Di Tore, S., Podovšovnik, E. A. (2022). Epistemologie Latenti: utilizzo di tecniche di Intelligenza Artificiale, Machine Learning and Text Mining per indagare sulle epistemologie personali dei docenti di sostegno relativamente al concetto di inclusione. Una proposta di flusso di lavoro. *RTH - Education & Philosophy*, 1 (9), 88-96.

Ekman, P. (1999). Basic emotions. In T. Dalgleish, M.J. Power (Eds.), *Handbook of Cognition and Emotion* (pp. 45-60). Hoboken: Wiley.

Ertmer, Peggy. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration?. Educational Technology Research & Development. 53. 25-39.

Evangelopoulos, N.E. (2013). Latent semantic analysis. *Wiley interdisciplinary reviews. Cognitive science, 4 6,* 683-692.

Feucht, F. C., & Bendixen, L. D. (2010). Personal epistemology in the classroom: A welcome and guide for the reader. In L. D. Bendixen & F. C. Feucht (Eds.), *Personal epistemology in the classroom: Theory, research, and implications for practice* (pp. 3–28). Cambridge University Press.

Giaconi, C. (2015). Qualità della Vita e adulti con disabilità. FrancoAngeli: Milano.

Hashweh, M. Z. (1996). Effects of science teachers' epistemological beliefs in teaching. Journal of Research in Science Teaching, 33(1), 47-57.

Hativa, N., & Goodyear, P. (2002). Teacher thinking, beliefs and knowledge in higher education. Springer: Cham.

Hofer, B. K. (2000). Dimensionality and disciplinary differences in personal epistemology. *Contemporary Educational Psychology*, *25*(4), 378–405.

Hofer, B. K. (2004). Exploring the dimensions of personal epistemology in differing classroom contexts: Student interpretations during the first year of college. *Contemporary Educational Psychology*, 29(2), 129–163.

Hofer, B. K., & Pintrich, P. R. (Eds.). (2002). *Personal epistemology: The psychology of beliefs about knowledge and knowing.* Lawrence Erlbaum Associates Publishers.

Hofer, B. K., & Sinatra, G. M. (2010). Epistemology, metacognition, and self-regulation: Musings on an emerging field. *Metacognition and Learning*, *5*(1), 113–120.

Hofer, B.K. (2001). Personal Epistemology Research: Implications for Learning and Teaching. *Educational Psychology Review* 13: 353-383.

Hofer, B.K. (2005) The Legacy and the challenges: Paul Pintrich's contributions to personal epistemology research. Educational Psychologist 40: 95–105.

Howard, B.C., McGee, S., Schwartz, N., Purcell, S. (2000) The experience of constructivism: Transforming teacher epistemology. *Journal of Research on Computing in Education*, 32 (4), 455-462.

Jordan, A., Lindsay, L., & Stanovich, P. (1997). Classroom teachers' interactions with students who are normally achieving, at-risk and exceptional. Remedial and Special Education, 18(2), 82-93.

Kane, R., Sandretto, S., & Heath, C. (2002). Telling half the story: A critical review of research on the teaching beliefs and practices of university academics. *Review of Educational Research*, 72(2), 177–228.

Khusbu T., Vinit, K. (2022). Application of Text Mining Techniques on Scholarly Research Articles: Methods and Tools, New Review of Academic Librarianship, 28:3, 279-302.

King, P. M., & Kitchener, K.S. (2004). Reflective judgment: Theory and research on the development of epistemic assumptions through adulthood. Educational Psychologist, 39, 5-18.

King, Patricia & Kitchener, Karen. (2002). The Reflective Judgment Model: Twenty Years of Research on Epistemic Cognition. Personal epistemology: The psychology of beliefs about knowledge and knowing.

Lawrence, P. (2015). Leading change – insights into how leaders actually approach the challenge of complexity. Journal of Change Management, 15(3), 231-252.

Maor, D. & Taylor, P.C. (1995). Teacher Epistemology and Scientific Inquiry in Computerized Classroom Environments. *Journal of Research in Science Teaching*, *32*(8), 839.

Martens, L. M. (1992). Inhibitors to implementing a problem solving approach to teaching elementary science: Case study of a teacher in change. *School Science and Mathematics*, *93*, 150–156.

McMillan, W. (2010). 'Your thrust is to understand' - how academically successful students learn. Teaching in Higher Education, 15(1), 1-13.

Muis, K. R. (2004). Personal Epistemology and Mathematics: A Critical Review and Synthesis of Research. *Review of Educational Research*, 74(3), 317–377.

Nespor, J. (1987) The role of beliefs in the practice of teaching, Journal of Curriculum Studies, 19:4, 317-328.

Palmer, B., & Marra, R. M. (2008). Individual domain-specific epistemologies: Implications for educational practice. In M. S. Khine (Ed.), *Knowing, knowledge and beliefs: Epistemological studies across diverse cultures* (pp. 325–350). Springer: Cham.

Phan, H. P. (2008). Predicting change in *epistemological* beliefs, reflective thinking and learning styles. British Journal of Educational Psychology, 78, 75-93.

Pintrich, P. (2002). The Role of Metacognitive Knowledge in Learning, Teaching, and Assessing. Theory into Practice, 41, 219-226.

Prawat, R. S. (1992). Teachers' beliefs about teaching and learning: A constructivist perspective. *American Journal of Education*, *100*(3), 354–395.

Schraw, G., & Sinatra, G. M. (2004). Epistemological development and its impact on cognition in academic domains. *Contemporary Educational Psychology*, 29(2), 95–102.

Sibilio, M. (2023). La semplessità. Principi per agire il cambiamento. Brescia: Morcelliana.

Soodak, L. C., & Podell, D. M. (1994). Teachers' thinking about difficult-to-teach students. *The Journal of Educational Research*, 88(1), 44–51.

Stark, J. (2002). Planning introductory college courses: Content, context and form. In N. Hativa and P. Goodyear (eds.), Teacher Thinking, Beliefs and Knowledge in Higher Education (pp.127-150). London: Kluwer Academic Press.

Stipek, D., & Byler, P. (1997). Early childhood education teachers: Do they practice what they preach? Early Childhood Research Quarterly, 12, 305–325.

Weinstock, M., & Roth, G. (2011). Teachers' epistemological beliefs as predictors of support for their students' autonomy. In J. Brownlee, G. Schraw, & D. Berthelsen (Eds.), *Personal Epistemology and Teacher Education* (pp. 165-179). Routledge, Taylor & Francis Group.

Windschitl, M. (2002). Framing Constructivism in Practice as the Negotiation of Dilemmas: An Analysis of the Conceptual, Pedagogical, Cultural, and Political Challenges Facing Teachers. Review of Educational Research, 72(2), 131–175.

Yadav, A., & Koehler, M. J. (2007). The Role of Epistemological Beliefs in Preservice Teachers' Interpretation of Video Cases of Early-Grade Literacy Instruction. Journal of Technology and Teacher Education, 15, 335-361.

Data, 08/04/2023

Dr. Annalisa Ianniello is the author of the article.

She is the author of the sections: 1.1. An Analysis of Teachers' Personal Epistemologies for Inclusive Education; 2. Materials and Methods; 2.1. Tool - Test-Mining and Latent Semantic Indexing (LSI); 2.2 Scoring and Data Analysis; 3. Results.

Prof. Ali Musleh Alodat is the Scientific Supervisor of the research.

Prof. Tonia De Giuseppe is the author of the section: 1. 2. Flipped Inclusion: An Active Learning Approach.

Prof. Felice Corona is the Scientific Coordinator of the research. He is the author of Introduction - Personal Epistemology Research: Implications for Learning and Teaching; Conclusion and Recommendation.