



NOVA

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Information
Management
School

DOCTORAL PROGRAMME

Information Management

**ICC – Integrated Cognitive Competencies and
Transformative Pedagogy for incorporating digital
technology into educational processes**

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A thesis submitted in partial fulfillment of the requirements
for the degree of Doctor in Information Management,
specialty in Information and Support Systems

August 2022

NOVA Information Management School

Universidade Nova de Lisboa

**CCI – Competências Cognitivas Integradas e Pedagogia
transformadora para incorporação de tecnologia digital nos
processos educacionais**

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Abstract

Contemporary society has been surprised by the speed and constant innovation of technological artifacts, creating a new culture based on cognitive development leveraged by the availability of technological infrastructure in the blink of an eye. This study suggests reflections on the contemporary educational pedagogical process assessing adjustments to the speed of learning with cultural changes in the era of the Information Society and presents an alternative way of thinking based on the development of integrated cognitive competencies and transformative pedagogy for incorporating digital technology in educational processes.

The applied methodology could be none other than a reflective process firmly centred on critical Pedagogy discussed in the light of questions that seek to answer how society thinks to proceed in its humanization process from this new reality onward. The result obtained is evaluated through alternatives and ways of thinking produced by the DSR – design science research methodology supported by the Focus Group technique made up of specialists and researchers from two of the best classified public Universities in Brazil supporting the qualitative discussion. The opinions of students and professionals were collected through a questionnaire processed by Smart PLS 3, providing inputs for organizing the qualitative process applied by the specialists.

The study, supported by a large bibliography, shows that cognitive development can be built by forming new competencies, integrated and absolutely subordinate to the context of the humanization values of a sustainable planetary society. The analyses are set in the Brazilian reality, however, compared to broader landscapes and universalizing pedagogical thoughts. The studies then converge on formulating the thesis ICC - Integrated Cognitive Competences and Transformative Pedagogy for incorporating digital technology in educational processes. Its evolution and research question are presented in the Introduction developed in Chapter 1.

The study was set in the Brazilian reality, however, compared to broader landscapes and universalizing pedagogical thoughts. Given this, from the perspective of critical reflection, the study, in our view, becomes a contribution to the renewal of the educational process that is necessary for a new way of inhabiting the biosphere, not only because the model in course affected deep technological innovations but mainly for the need to know what can or should be done with this capital of knowledge for the Peace and Good of humanity. Indeed, education

must be a target for transformation by the technological revolution, notably through artificial intelligence and other connective media artifacts.

We know that there is no structured model to be followed that truly solves this complexity of contemporary living. This work will put technology on the agenda by improving today's educational processes, which include sociologically networked associations. However, launching a reflection on the need to rethink the critical pedagogical values that can also guide the cognitive bases of learning. Unfortunately, there are no final recipes, only proposals and learnings, including pain. At this very moment, we cannot fail to mention the terrible experiences with the failed attempts to organize Brazilian public education at a distance due to the pandemic suffered by Coronavirus 19. Comments on this will come in our concluding section supporting the necessary transformative Pedagogy that this country yearns for and needs as a saving bridge to the future.

Key words: Integrated cognitive competencies; Transforming pedagogy; Self-efficacy; Institutional complexity; Teaching and learning; Critical pedagogy.

Resumo

A sociedade contemporânea foi surpreendida pela velocidade e inovação constante dos artefatos tecnológicos criando, num piscar de olhos, uma nova cultura alicerçada no desenvolvimento cognitivo alavancado pela disponibilidade de infraestrutura tecnológica. O estudo sugere reflexões sobre o processo pedagógico educacional contemporâneo, avaliando ajustes à velocidade de aprendizagem com as mudanças culturais na era da Sociedade da Informação e, apresenta uma alternativa de pensar baseada no desenvolvimento de Competências cognitivas integradas, sob os efeitos de uma Pedagogia transformadora para incorporação da tecnologia digital nos processos educacionais.

A metodologia aplicada não poderia ser outra senão um processo reflexivo fortemente centrado na Pedagogia Crítica discutido à luz de questões que procuram responder de que forma a sociedade pensa caminhar em seu processo de humanização a partir dessa nova realidade. O resultado obtido é avaliado por meio de alternativas e modos de pensar produzidos pelo DSR - Design Science Research apoiado na técnica de Focus Group composto por educadores especialistas e pesquisadores de 2 das Universidades públicas mais bem classificadas do Brasil apoiando a discussão qualitativa. Foi previamente ouvida a manifestação de alunos e profissionais por meio de um questionário processado pelo Smart PLS 3 fornecendo subsídios para a organização do processo qualitativo aplicado pelos especialistas.

O estudo, apoiado em ampla bibliografia, mostra que o desenvolvimento cognitivo pode ser construído pela formação de novas competências, integradas e absolutamente subordinadas ao contexto dos valores de humanização de uma sociedade planetária sustentável. As análises são ambientadas na realidade brasileira, entretanto cotejadas com paisagens mais amplas e pensamentos pedagógicos universalizantes. Os estudos convergem então para a formulação da tese CCI – Competências Cognitivas Integradas e Pedagogia transformadora para incorporação de tecnologia digital nos processos educacionais. Sua evolução e questão fundamental de pesquisa está apresentada na Introdução desenvolvida no Capítulo 1.

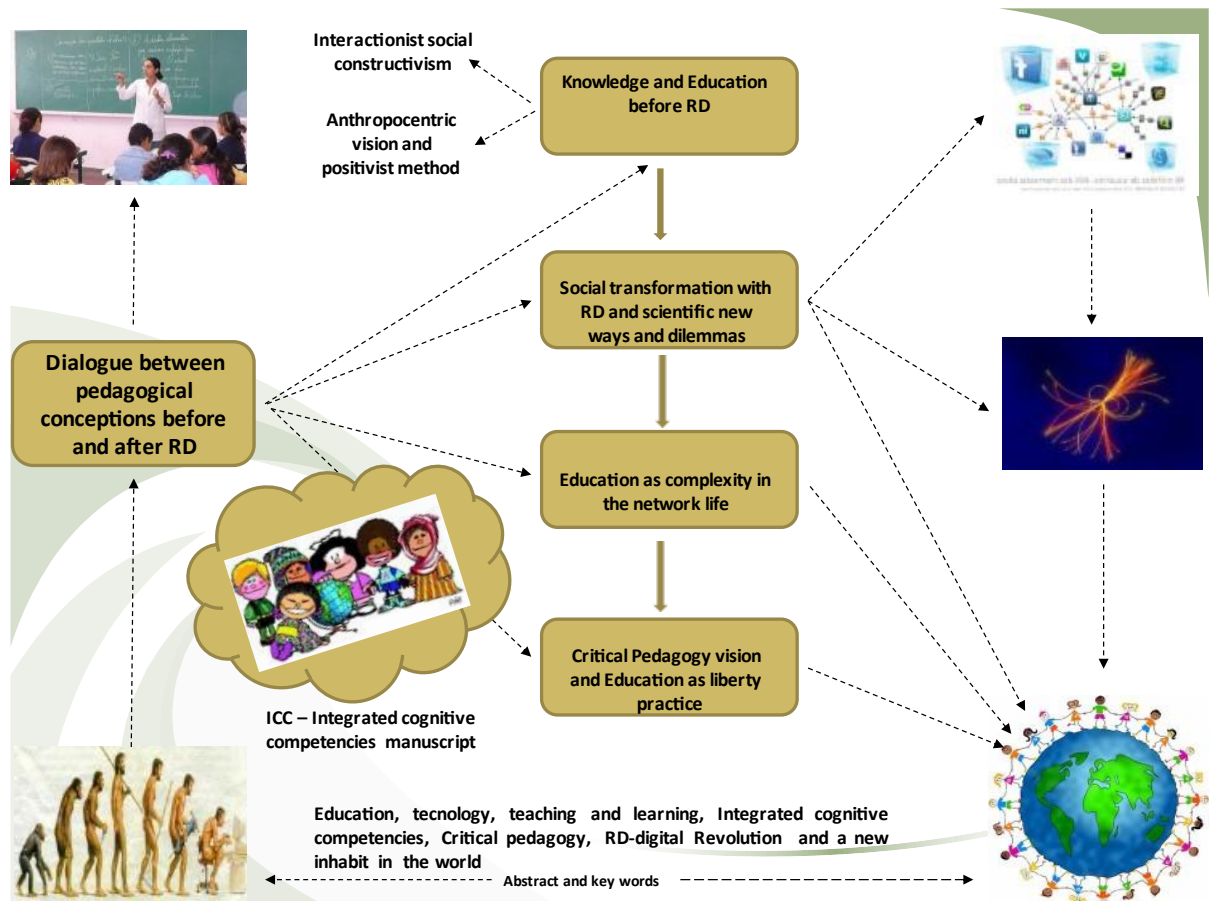
Sob a ótica de uma reflexão crítica, o estudo, em nossa visão, torna-se uma contribuição à renovação do processo educacional que se impõe como necessário para nova forma de habitar a biosfera, não somente em função do modelo em curso afetado pelas profundas inovações tecnológicas, mas principalmente pela necessidade de se saber o que se pode, ou se deve fazer

com esse capital de conhecimento para a Paz e Bem da humanidade. Com certeza, a educação deve ser um alvo de transformação pela revolução tecno-pedagógica, notadamente por meio da inteligência artificial e os demais artefatos midiáticos conectivos.

Sabemos que não existe um modelo estruturado a ser seguido que verdadeiramente resolva essa complexidade da convivência contemporânea. Esse trabalho coloca em pauta a tecnologia melhorando os processos educacionais de hoje nos quais se incluem as associações sociológicas em rede. Entretanto lança a reflexão sobre a necessidade de se repensar os valores pedagógicos críticos que possam orientar as bases cognitivas do aprender. Não há receita final, infelizmente, apenas propostas e aprendizagens, inclusive pela dor. Não podemos deixar de mencionar nesse exato momento as terríveis experiências com as fracassadas tentativas de organizar o ensino público brasileiro à distância em função da pandemia sofrida com o coronavírus 19. Os comentários a respeito virão em nossa seção conclusiva suportando a necessária Pedagogia transformadora que este país anseia e necessita *como ponte salvadora para o futuro*.

Palavras-chave: Competências cognitivas integradas; Pedagogia transformadora; Autoeficácia; Complexidade institucional; Ensino -aprendizagem; Pedagogia crítica.

Graphical abstract



Publications

1. ICC – “Integrated cognitive competencies for incorporating technology in educational processes,” paper and Doctoral project accepted and presented at the 13th CONTECSI - International Congress on Technology and Information Systems Management, held in São Paulo, from June 1 to 3, 2016.
2. Paper published in E-book format by Ed. Atena [Atena Publisher]

Wiziack, J.C. & dos Santos, V.D. (2019). ICC – “Integrated cognitive competencies for incorporating technology in educational processes.” *Information Systems and Technology Management*; v. 2, Ponta Grossa (PR): Atena Editora, 2019. DOI 10.22533/at.ed.02919190322.
3. Paper and Doctoral project accepted and published in the Congress proceedings of CISTI'2016 - 11th Iberian Conference on Information System and Technologies - Gran Canaria, Canary Islands, Spain, Jun. 2016: Incorporating technology in educational processes: a proposal to extend the model Technology, Pedagogy, and Content Knowledge with the application of Integrated Cognitive Competencies.

3.1: Initial Research

Wiziack, J. C. (2016, June). ICC—Integrate cognitive competences for incorporating technology into educational processes: Initial research. In *2016 11th Iberian Conference on Information Systems and Technologies (CISTI)* (pp. 1-8). IEEE.

3.2: Paper

Wiziack, J. C., & dos Santos, V. D. (2016, June). Incorporating technology into education processes: Proposal for an extension of the “Technology, pedagogy, and content knowledge” framework by applying integrated cognitive competencies. In *2016 11th Iberian Conference on Information Systems and Technologies (CISTI)* (pp. 1-8). IEEE.

4. Article

Wiziack, J. C., & dos Santos, V. D. (2019). Pedagogia Transformadora e o Reaprender nas Humanidades Digitais. *Revista Ibérica de Sistemas e Tecnologias de Informação*, (E17), 610-625.

5. Article

Wiziack, J. C., & Dos Santos, V. M. P. D. (2021). Evaluating an integrated cognitive competencies model to enhance teachers' application of technology in large-scale educational contexts. *Heliyon*, 7(1), e05928.

6. Articles under revision:

Wiziack, J.C., Yanaze, M. & dos Santos, V.D. (2021). Teaching and Learning Communication and Marketing: determinants of differentiated performance with ICC

Wiziack, J.C., Yanaze, M., dos Santos, V.D., & Braga, A.R. (2021). Digital culture, behaviour, and consumption: Communication & Marketing building the future

Wiziack, J.C., Yanaze, M., dos Santos, V.D., & Braga, A.R. (2021). A Good Project for Brazil: Integrated Cognitive Competencies and Critical Pedagogy on the Move to the Future.

Acknowledgements,

Gratitude!!! It's the best I can say at this vital moment in my life. My God, what kindness and generosity. Thanks.! My family, Dri (strength, love, and light), Vini (love and hate, He's at the age to kill me), Carol (my beautiful favourite daughter) and Caio (I don't know what is said about sons-in-law, but we share my daughter and Palmeiras, football tri-champion), Thiago & Lisa, (my son and daughter-in-law and my grandson John, a dear new family from Australia that I only met last Christmas. Lovely Zuquinha, and Carlão, father-in-law and dear friend in life and fishing, who waits for me with God (hopefully for a long time to come). I offer this achievement to everyone with a loving hug.

Cesar Nunes (UNICAMP) and Cleiton de Oliveira (UNIMEP), dear professors. Thank you so much for being so helpful with the project proposal and guidance in the master's degree. I will never forget your attention and affection. My respects to the NOVA IMS - Lisbon and ECA-USP professors, with thanks for their dedication during the formation courses taken.

Researchers from GEPEM, CEACOM, and the Basic Education of Valinhos Group of Coordinators, in the names of Telma Vinha, João Castanheira, and Ana Angélica Júlio, respectively. I am immensely grateful for the invaluable contributions of all participants in the evaluative activities of the Focus Groups. Thanks for the value and credibility that all the participants added to the results of this survey.

Professor and friend Mitsuru Yanaze, I am grateful for the invitation and opening of this journey towards the Ph.D. in this unique program with Universidade Nova IMS in Lisbon. Professor and friend Vitor Santos, wise and experienced guidelines, even on responding to reviewers with emotional intelligence and effectiveness, as well in all sections of the project. May God do the best *He* can for you, allowing health and happiness with your family and friends. My affectionate hug to both of you.

My recognition and homage to all Health professionals and to all professors who fought on the front lines in the same struggle saving lives or fighting against negationism and resisting in this country that so desperately needs this transforming educational vaccine. My recognition, Blessings from God, and strength to continue resisting. We'll win!

In closing, I would like to thank and say to all the professors of the evaluative Juri, in the person of Prof. Kleber Carrilho, that this Thesis was like a small stream that divides itself when walking through different landscapes and crossing obstacles. However, its waters meet again before reaching the sea. This way, our contribution to the Brazilian educational process will be intense and challenging. But we will have to deposit our waters there!

João Carlos Wiziack

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Acronyms

All acronyms referred to throughout this work are listed below in the alphabetical order they appear in the text and translated when a corresponding designation exists.

BNCC	Common National Curriculum Base [Base Nacional Comum Curricular]
CONAE	National Conference on Education
DCCM	Domain of Cognitive and Motivational Competencies
DSR	Design Science Research
ECA	School of Communications and Arts
ENEM	National High School Exam [Exame Nacional do Ensino Médio]
FUNDEF	Fund for the maintenance and development of Elementary Education
FUNDEB	Fund for the development of Basic Education
GDP	Gros Domestic Product
H1, H2, H3	Hypotheses 1, 2, and 3.
ICC	Integrated Cognitive Competencies
ICT	Information and Communication Technology
IMS	International Management School
IT	Institutional Theory
MEC	Ministry of Education and Culture
NGOs	Non-Governmental Organisations
OECD	Organisation for Economic Cooperation and Development
PNE	National Education Plan

PISA	Program for International Student Assessment
RD	Digital Revolution [Revolução Digital]
SEM	Structural Equation Modeling
SNE	National Education System
TPACK	Technological Pedagogical Content Knowledge
TPK	Technological Pedagogical Knowledge
TCK	Technological Content Knowledge
TOE	Technology Organisational and Environmental Framework
UTAUT	Unified Theory of Acceptance and Use of Technology

Chapter 1: Introduction

The passing of the millennium, in fact, aroused great concerns that many did not even know what the exact extensions of their fears would be. Technology has taken centre stage in the facts with the unknown millennium bug, making system analysts and operators work hard to find an alternative plan for the failure of countless programs that still had dates with only two digits and, therefore, would not do the correct reading of the change for the year 2000.

The development of digital technology gained strength, generating more precision and economy due to the shorter processing time, which, together with the emergence of the internet at the height of the cold war in 1969, ended up revitalizing the mechanisms for building networks global social communication, making an assimilation factor in the social transformations that took place along this path real-time.

These facts start the shape of an accelerated scenario of technological changes and societal transformations.

1.1. Shaping the contextual scenario

Living in the new millennium prompts us to understand the rapidly changing scenario pushed by constant and new technologies that, in turn, and work gradually transform our dwelling in the biosphere. It seems that everything flows faster. Human life is being compressed into a smaller space, thereby losing its possibility of escape to the immensity that our planet seems to have. Compression of space-time (Harvey, 1989), and useless academic discussions about modernity and postmodernity, indicate the need to search for the actual values of humanization that sustain us on the planet towards the future of our existence.

Kerckhove contributes to this understanding and points out in his work *Pele da Cultura* (2009) that technology requires preparation for assimilation: as with the fax, which took a while to be absorbed, virtual reality also awaits a space in our “collective psychology” until it can be assimilated. He also states that one way to get even with the dependence on these “psycho technologies,” a term he uses to define them, is to integrate them into our lives. Thus, he concludes, a “new human being will be born. Consequently, we can also figure that further education must be taken or, in line with its complexity, be reborn and integrated with the new technological habitation.

Considering the scenario of new education for a new world, the best understanding of the role of education and its pedagogical component applied in face-to-face school, taking the Brazilian reality as a basis, was considered the first foundation for the study to compare it with international references.

This stance will reveal that the results of educational processes in most countries surveyed and confronted by the OECD - Organization for Economic Cooperation and Development are insufficient in the face of technological development and the need for cognitive advances that enhance the improvement in quality of life. For most countries, the results of the surveys show a profile of lagging behind the speed of innovation.

The second approach aims to reinforce the understanding of the technical and political meaning of the concepts of critical pedagogy as a driving factor for the application of more effective teaching-learning models.

Studies on technology adoption models in educational processes emerge in line with literary production, with the observation that, in general, ICT has been taken from the social to the schools without the necessary pedagogical care. They are producing fewer effective results in the face of what is needed to overcome the cultural backwardness in the area.

The evolution of the study to the ICC model - Integrated cognitive competencies as pedagogical incorporation to contemporary and future teachers consider that the new situations call for no longer a frontal teacher-student posture. An updated mediating and guiding role is crucial with the social transformations of digital technology and the most significant challenges added to teaching responsibilities.

In its overwhelming impact, the communicative revolution alters consciences, values, expectations, and attitudes towards thinking and resolving the things of living. Sharing and distributing information and knowledge mobilize and contribute to constructing new social and political participation models. Paulo Freire, recognized as a mentor of education for conscience, showed how certain he said that “nobody educates anyone, nobody educates himself, and men are educated among themselves, mediated by the world” (Freire, 2011 p.95-101).

We are other animals living in new fields. We need to profoundly reconfigure our pedagogy as a form of humanization, especially accompanied by a posture motivated by

teacher self-efficacy (Bandura, 2008), necessary to face the enormous cognitive and structural challenges.

The best proposition of the model converges to factors such as knowledge of content to be taught, pedagogical content for the best way to teach, correct and adequate technological application, and teacher motivation for self-efficacy. Thus, characterizing ICC - integrated cognitive competencies, presented as a model for adopting technology in teaching and learning processes.

1.2. Motivations and justifications

A recent study by the Organization for Economic Cooperation and Development (OECD) points out that the use of technology, as well as massively equipping students and classrooms with electronic devices, is not enough to improve school performance: as seen in the latest edition of the International Program for Student Assessment (PISA, 2012), some countries have invested heavily in infrastructure and have not yet achieved notable improvements in their results in terms of written comprehension, mathematics, and science.

Some additional observations from the OECD reported in 2012 that remain with a similar profile until nowadays had added motivation to explore this study:

- ICTs are still outside schools, despite intense use in social life;
- Despite using more than 30 minutes daily for digital education, the results of Spanish students were below the average for developed countries. In contrast, students in Singapore, Shanghai, South Korea, Japan, Canada, and Hong Kong, who did not devote more time to the internet at school than other OECD students, achieved the best results. The study deduces that essential skills for internet browsing can also be taught using traditional analogue instruments and pedagogies;
- To take advantage of technological devices, it is first necessary to improve the equity of educational systems because what counts is the quality of technological use and not its quantity. The Australian example is cited as the one that adds value to the school, given that teachers are trained or have experience. For new technologies to be effective, it is necessary to start using the appropriate pedagogical assumptions.

In developing this topic, my desire as a doctoral student is that the proposed thesis may contribute to those who have not yet managed to realize that we live in a very different world

in this millennium today. So different that it seems to have been restarted, despite not having been destroyed (yet) by a nuclear catastrophe.

However, this perspective concerns how the world started to communicate from the advent of technologies, notably the digital one. The second decade of the new millennium introduced us to the internet, bringing one end of the globe to the other and placing the world of instant information at the touch of our fingertips. In this context came the challenge of the Doctoral Program in Communications Science by ECA - School of Communication and Arts of the University of São Paulo in partnership with the Universidade Nova – Information Management School of Lisbon.

In thinking about a research project, the urge to build an idea that could add an alternative proposition of an information system for decision and incorporation of technology in Brazilian Education effectively to escape cultural and bad backwardness immediately arose. Quality has been reflected in the OECD's PISA statistics. Today, five years after that day, I must say that it is really unacceptable to continue the poor results presented by Brazilian education. My motivation is multiplied by ten when we find that the PNE - National Education Plan, an instrument of constitutional planning, has been vilified by the government for its non-compliance and its last ministers' deficient level of Education. Therefore, it is necessary to speak, think and propose.

1.3. Goals

- Contribute to the thinking of an educational model based on Integrated Cognitive Competencies - ICC - incorporating technology in the teaching-learning processes, closely linked to pedagogical skills, disciplinary content, and teaching self-efficacy.
- Overcoming the current difficulties, boosting and aligning the school to produce knowledge and new skills for new action forming the planetary citizen. Self-efficacy enters the proposition as a founding condition of will and capacity to overcome all sorts of difficulties experienced by Education in the political context and of the teacher as an essential actor in the mediation process between students, school, and society.

We will privilege the opportunity to discuss aspects involving political participation and the phenomenon of activism in the social context, and the ongoing changes in the process

of living in the biosphere in their future expectations and dilemmas for creating a citizen-educated society for sustainability.

Finally, answering the fundamental question about what to do with all this production of information and reflections, we intend to propose the incorporation of the Integrated Cognitive Competencies model into the teaching and learning process of the Brazilian Educational System during the revision of the PNE - National Education Plan (2014/2024), that will take place at the end of 2021

The moment is favourable considering that the current PNE has lost momentum with the administrative inefficiency of the last governments and the strengthening of the present non-conformity among educators who wish to resume and overcome the difficulties of this unstable and hostile scenario for Education.

1.4. Evolution of Studies

Information and Decision Systems by Nova IMS and Communication Sciences by the School of Communication and Arts of the University of São Paulo, a Doctoral Program offering dual degrees from the universities involved, represented an almost insurmountable challenge for me, given the rigor of theoretical-practical training involved, notably the development of research skills followed by the requirements for participation and acceptance of papers in congresses as well as publications in qualified academic journals. The programmatic activities involved proceeded as follows:

DISCIPLINE	TEACHER
Quantitative Methods for Research I	Tiago Oliveira – Nova IMS
Quantitative Methods for Research II	Pedro Simões Coelho- Nova IMS
Research Seminars I	Fernando Lucas Bação- Nova IMS
Research Seminars II	Cristina Galamba Marreiro- Nova IMS
Research Seminars III	Marco Octavio Trindade Painho-Nova IMS
Reticular epistemologies: questions about the method in the study of Digital Networks and Knowledge Perspective through interaction with computers	Máximo Di Felice – ECA-USP
Digital Humanities	Paletta, F.C.; Siqueira, I. C. P. – ECA-USP
Marketing & Persuasive Communication	Mitsuru Yanaze – ECA-USP
Public Relations Planning	Margarida M. K. Kunsch – ECA-USP

Study projects and thematic evolution occurred during Research Seminars I, II, and III:

Research Seminar I:

1. One Page Project: “Adoption of Connectivism in the Piagetian methodology of the Elementary School in the context of techno-relational changes.”
2. Ph.D. proposal: “: “Connective communication and education for the new living of people and things in reticular ecosystems.”

Research Seminar II

3. Ph.D. proposal version 4: “Understanding the pedagogical challenges for incorporating technology in Brazilian education.”
4. Literature review presentation with another tentative title: “Digital communication, technology and educational complexity for learning in the new inhabit.”

Research Seminar III

Course evaluation article: “Assessing the application of integrated cognitive competencies for incorporating technology in Brazilian education.”

In the initial phase - presented in Chapter 1, the alternatives for the appropriate path of thematic direction matured the idea that there was space for the discussion of a model that took into account the best possible use of the potential of digital technology, however considering the re-examination of pedagogical concepts, thus avoiding the simple transposition of technology used in social life into the school halls. The conceptual conviction about the transformative role of pedagogy in driving educational benefits with the appropriate use of technology was based on its own value as a fundamental and canonical content of education.

Chapters 2, 3, 4, and 5 then address the entire referential theme based on texts extracted from articles and study projects published and presented in Congresses, aiming at discussion and feedback in the academic space and thus shaping the theme and collecting contributions for organization and structure at the end of the thesis.

The questions addressed in light of the magnitude of the educational problems' environment initially focused on reexamining the teaching role in the face of technological innovations within a pedagogical context that leads to the most effective way to achieve this

goal. Educational philosophies, learning theories, and relevant analyses of education were aligned as being complex in the context of the digital communicative revolution.

In a second moment, issues related to the teaching environment in the extraordinary setting of the educational system should be considered, summarizing the dilemma of how to move through the overwhelming technological change by making digital immigration and with what behavioral parameters in the face of the new.

Critical pedagogy emerges as a basis for choosing and responding to constructing the profile of a new educational activity for a new inhabitant of the biosphere. The understanding of the problem grew, and the need to focus on the solution in the search for a strategic path that considers the traditional teacher's role and his reframing in the contemporary context of a changing society.

Education as centrality in the humanization process needs to be revised and updated, incorporating the technological elements arising from the digital communicative revolution.

Figure 1 depicts the synthesis of the problem, and the fundamental question to be answered became the objective to be achieved with this thesis. The designed scenario is interesting for a reflection on what could be seen as a graphic summary, with a chain of causes and effects in which the innovation of digital technologies leaves us with the educational tech-leg; communicational transformations lead us to shifts in social life, and the overlapping of reticular ecosystems provide new forms of relationship and housing. It remains to renew and innovate or to reinvent the educational process.

According to Santos (2012), in the same way as a large organization, Brazil that does not walk, needs encouragement for creativity and innovation to form a productive pair in breaking down barriers related to resources and blockages of its institutions and a people who no longer seem to believe in themselves as if they were cattle.

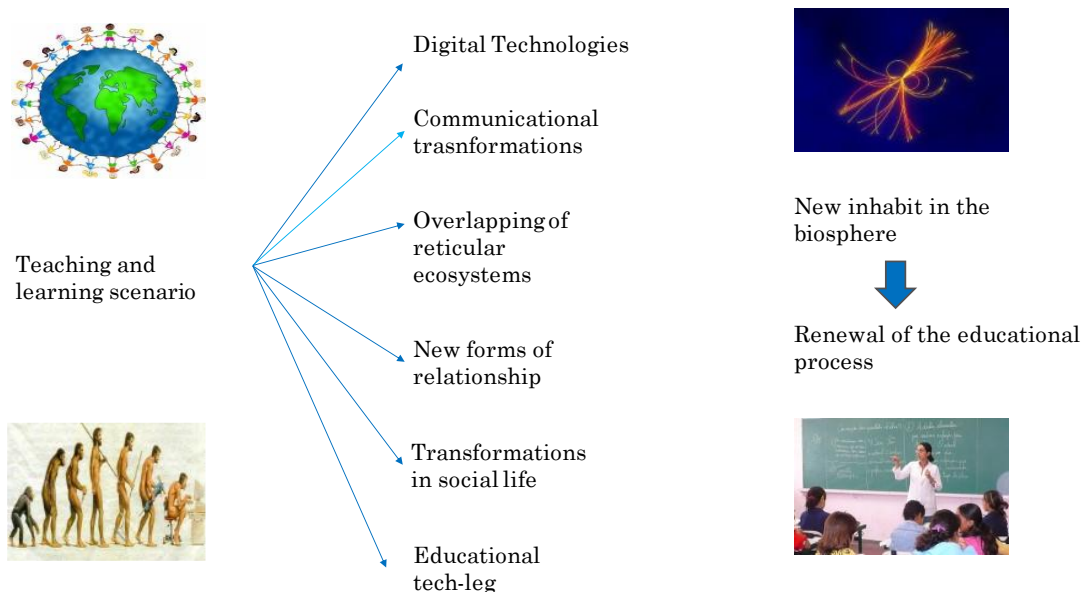


Figure 1: A synthetic scenario of technological evolution and the backwardness of the educational process.

The problem

Education as a driving force in the humanization process needs to be revised and updated, incorporating the technological elements arising from the digital communicative revolution.

The central investigative question seeks to understand how strategically planned technological adoption could boost the quality of educational processes as a result of an integrated action between pedagogical ideas and technology, collaborative human relations, and sustainable public policies.

As a solution path, we may expect: Integrated action between pedagogical ideas + technology + collaborative human relations + sustainable public policies.

1.5. Research line and methodological strategies

The approach to solving the problem posed in this research was the traditional scientific method. The activities prioritized are parts of the following chapters. In this way, the scenario of studies and the methodological strategies align with studies based on the theoretical foundations chosen from the first movements and perceptions about the real-life procedure in which Education and its processes represent crucial changing issues in contemporary

civilization. These fundamentals are focused on: Education as *modern complexity*, critical pedagogy as *transformative action*, and Education and socio-economic/political environment as *the locus of social behaviours-changing*. The key issues worked were:

-
1. Pedagogy as a transformative action before and after the digital revolution with Lee Shulman (1986), Giroux (1999), Saviani (2005), Freire (2007), and Siemens (2005). Studies on large-scale educational processes have Brazilian teaching and learning systems as references.
 2. Understanding the Brazilian system's educational performances reported by the OECD and political, socioeconomic, and demographic difficulties.
 3. Studies on the models of *technological adoption* in use from the perspective of Nova IMS university.
 4. *Study of TPACK*- Technological Pedagogical Content Knowledge and the digital learning theory of George Siemens (2004). TPACK is *the primary reference* and its author's adaptations.
 5. *Study of the DSR* methodology – design science research with Focal Group technique chosen as the primary instrument in the qualitative assessments that were carried out (Hevner et al. (2004); (Peppers, K. et al., 2007); ((Langford & McDonagh, 2003).
 6. *Study and application* of the Smart PLS methodology in quantitative approaches (Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011).
 7. Creation and evolution of the adoption model proposed in the research with the writing of articles and evaluations by the academic community:
 - 7.1. Studies on the complexity of the Brazilian educational process, technological innovations, and reflections on the teaching role in the changing context. Adaptations to TPACK, exchanging, in the original concept, the use of knowledge for competence, as well as adding motivational self-efficacy to TPACK (Bandura, 2008).
 - 7.2 Presentation of topic and discussions for feedback at the 13th Contecsi- International Congress on Technology and Information Systems Management - FEAUSP proceedings. (2016).
 - 7.3. Article published in e-book by Editora Atena (2019).
 - 7.4. Validation with the participation of Paper and Doctoral project accepted and published in the Annals of the CISTI' Congress - 11th Iberian Conference on Information System and Technologies - Gran Canaria, Canary Islands, Spain, Jun. 2016
 - 7.5. Publication of the article Transforming Pedagogy and Re-Learning in the Digital Humanities 612 RISTI, No. E17, 01/2019.
 8. ICC model development with the addition of ethical values to TPACK – Application of the model to large-scale educational processes, based on the Brazilian system. Validation with publication in Heliyon with the *article "Evaluating ICC - Integrated Cognitive Competencies for enhancing Teacher's adoption of technology in a large education environment."* (2021).
 9. Structuring and organization of the Thesis for examination. (Approved on 7/20/2022). Start preparation for *Instantiation Exposition* to present a project containing the researched model for application in Brazilian educational processes through public policy produced with the PNE - National Education Plan- 2014/2024 from the discussions that will take place in 2023. Conclusions focusing on political and bureaucratic limitations

10. *Expository instantiations*: Start preparation of a project model for application in Brazilian educational processes through public policy produced with the PNE - National Education Plan- 2014/2024 from the discussions that will take place in 2023. This stage also includes the contents of the three following articles under revision:

11.1 Digital culture, behaviour, and consumption: Communication & Marketing building the future. (with quantitative methodological application with Smart PLS 3).

11.2 Teaching and Learning in Communication and Marketing: determinants of differentiated performance with ICC.(with quantitative methodological application with Smart PLS 3).

11.3 Education in Brazil – critical pedagogy and integrated cognitive competences in the recovery for the future

Note: *The expository instantiations* stage is outside the doctoral program; however, born as an inherent commitment to the research project developed.

The methodological path chosen in this study was research and bibliographic analysis to search for a referential model of technological incorporation into the educational processes initially focused on the teaching activity. As reference parameters initially found were the studies of Punya Mishra and Matthew J. Koehler, teachers at Michigan State University. They described a schematic model of technological knowledge for integration into the teaching and learning processes, currently known by the acronym TPACK- technological, pedagogical, content knowledge.

Koehler & Mishra (2007), inspired by Shulman's concepts (1986), innovated by presenting the TPACK model considering the pedagogical and technological knowledge added to the discipline's content taught. For the authors, the adoption and technical use in teaching and learning activities must constitute knowledge applied in a differentiated and integrated way according to the disciplinary contents, as shown in figure 2.

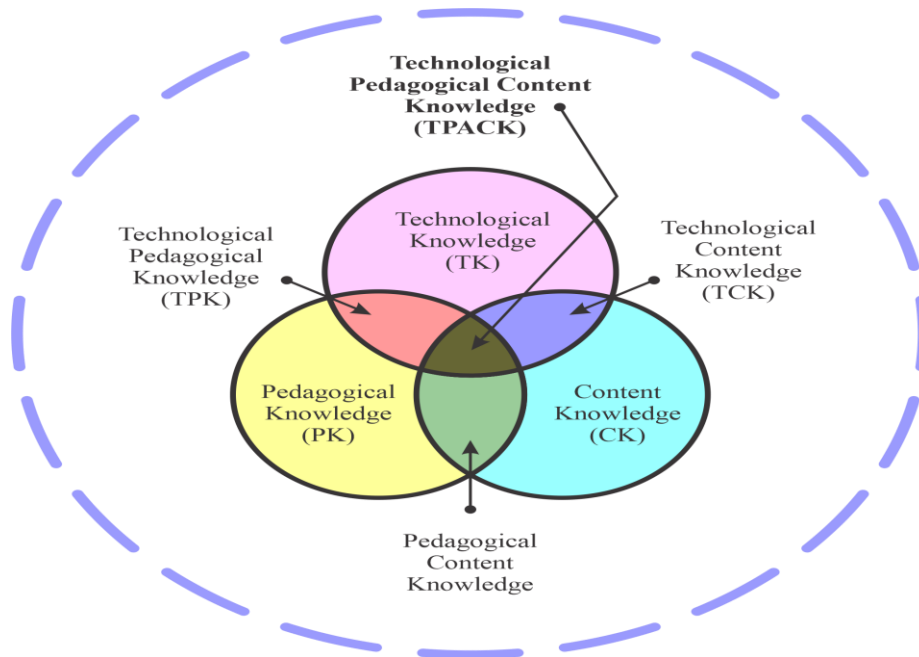


Figure 2: TPACK framework and the knowledge components of Koehler & Mishra

The authors consider the components of this framework as critical factors for the success of the technological application in education, which makes them entirely useful for the present study. This methodological application describes an evolution of integration between three fields of knowledge: the contents, pedagogy, and technology, presented in a series of published works until they reach the current model, showing the interaction between TCK (Technological content Knowledge - technological knowledge content) and TPK (Technological Pedagogical Knowledge). In this model, we understand as essential the integration of the factors mentioned below for the technological adoption in education:

- Content: knowledge of the instructional content applied in the programs educational activities and practical relations with other subjects in the curriculum;
- Pedagogy: application in harmony between pedagogical concepts, technology and content looking for the best way to facilitate learning;
- Technology: technological knowledge for integrating content and mediatizing the pedagogical forms used.

We have chosen to make the concept of competencies explicit in the TPACK model, considering that the new environment in transformation and knowledge requires new skills, attitudes, and values necessary to incorporate into the educational process because the knowledge isolated is incomplete to the teaching profile.

It is necessary to reconfigure it to know how to act responsibly, which implies mobilizing, integrating, and transferring knowledge, resources, and skills and adding value to the rapidly changing environment. Prahalad and Hamel (1990) stated that these are the key competencies that distinguish the winning organizations precisely and that they must be seen as assets to be constantly developed by continuous learning, organized, and intentionally pursued, which characterizes them as cognitive processes.

The TPACK model was reconfigured in its construct, starting to contain explicit skills, attitudes, and values instead of knowledge, generating the expression resulting from “knowing how to act responsibly,” according to the conceptual meaning of the concept of competence defined in line with referential research of this study.

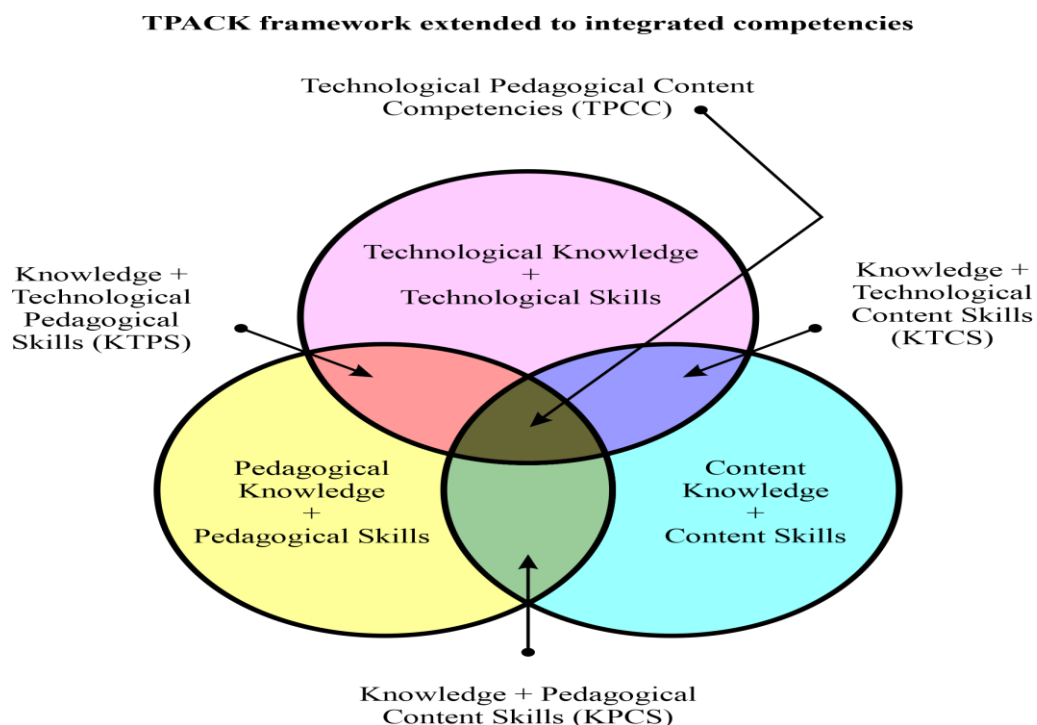


Figure 3: Adaptation of the TPACK framework model (Koehler and Mishra, 2007).

Note: authors and the reconfigured original knowledge components changed for competencies.

In this reconfiguration, the TPACK model, bringing together Pedagogical, Technological, and Content Competencies, is now also perceived with due focus on general skills and remains intact in its original design. Now, the goal is to demonstrate that it can alternatively contain the list of formative predicates for teaching in an expanded way that includes attitudes complementing general skills and closing the extended concept of competencies instead of just knowledge. A profile to be considered a reflective proposal shows the teaching mediation and intellectual content of ways of being, knowing, and knowing how to act identified as integrated cognitive competencies. The focus on general skills, attitudes, and teaching values results from motivation and effectiveness, in line with Albert Bandura's theories, complementing the CCI model under construction. We can then see the model in the representation of figures 3 and 4

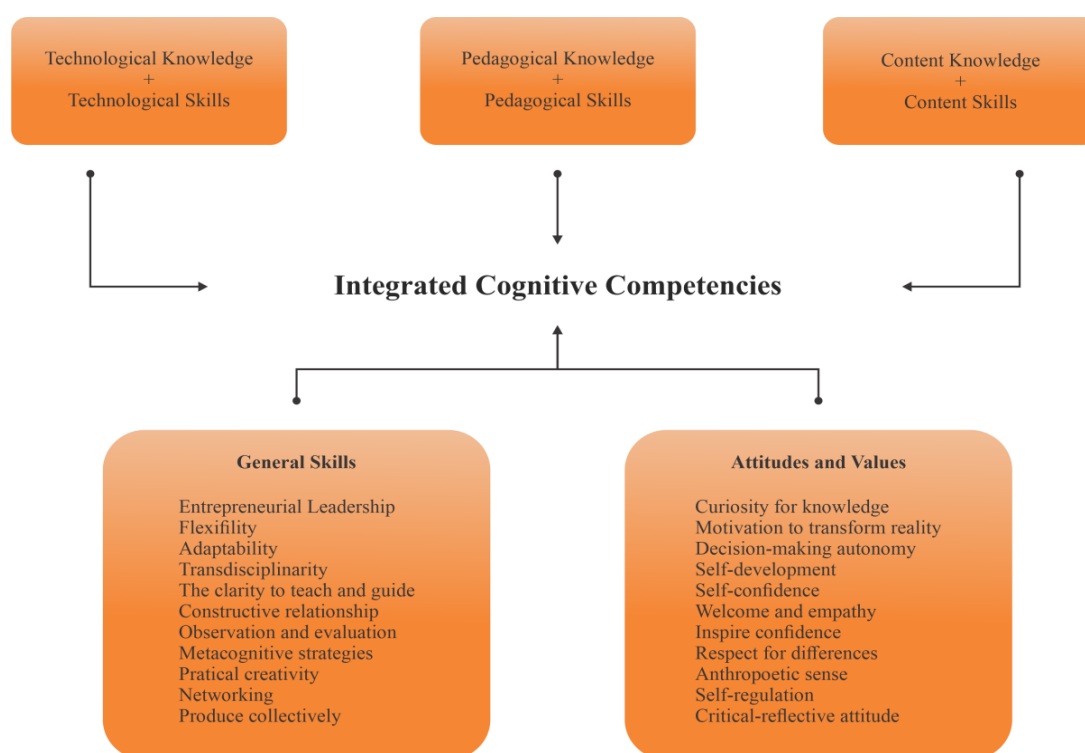


Figure 4: Teacher profile to integrated cognitive competencies model (ICC).

Note: authors, with the adaptations taken from Koehler & Mishra (2007), Bandura (2008), Morin (1999), and Xus Garcia & Josep Puig (2010).

In its first phase, the project's design, adapted by the authors, expresses the focus on teaching protagonism in educational processes, with total inspiration from the Koehler and

Mishra (2007) model, but introducing new concepts in general skills and attitudes and values taken from Bandura (2008), Morin (1999), Xus M. Garcia and Josep Puig (2010). The study's methodological sequence will continue with the theoretical constructions and formation of the final design for the ICC - Integrated cognitive competencies, still maintaining the conceptual role of teachers but within the context of large-scale educational processes.

The illustration in figure 5 shows the first and most important construct (in the qualitative assessment of the focus groups and the authors) in the composition of the final framework that will demonstrate in a study based on the reality of the Brazilian Education System reference.

The highlight for the reconfiguration of TPACK is introducing the concept of competence instead of knowledge and including Bandura's self-efficacy motivational skills. The adaptations are substantial and follow the authors of the renowned model (Koehler & Mishra). As a question or reflective proposal, we can say that it is not difficult to compare the competencies conceptually defined here and the quality work always required of teachers in all categories of our education system. The challenges are immense. The level of success achieved is certainly not satisfactory for teachers' or society's wishes, making questions and frustration always present in the teaching context. The motivational element for self-efficacy appears in research given the well-known and unchanged environment of wear and tear involving the teaching life, due to the natural demands and comparative and heavy difficulties against the lack of attention to the career and its motivational components in almost all senses, notably for basic public education.

The general skills and the Attitudes and Values indicated in Figure 4 give concrete meaning to the importance and complexity of teacher formation and, at the same time to the strategic role represented in mediation between students and the contemporary world in which we live.

These concepts were inspired by classic educational literature and contemporary researchers who describe the cartographies and challenges of teaching work (Freire, P., 2014; Morin, E., 2001; Becker, F., 2000; Hargreaves, A., Earl & Ryan, 2001; Hargreaves, A., & Fink, D. 2007; Sacristán, J.G et al., 2016; Perrenoud, P. 2015; Rosário, P., Núñez, J. C. & González-Pienda, J. 2019; Camas, N. P. V. 2012; Gerald, C. M. G. 2001 e Garcia, X.M., Puig, J.M. 2010.

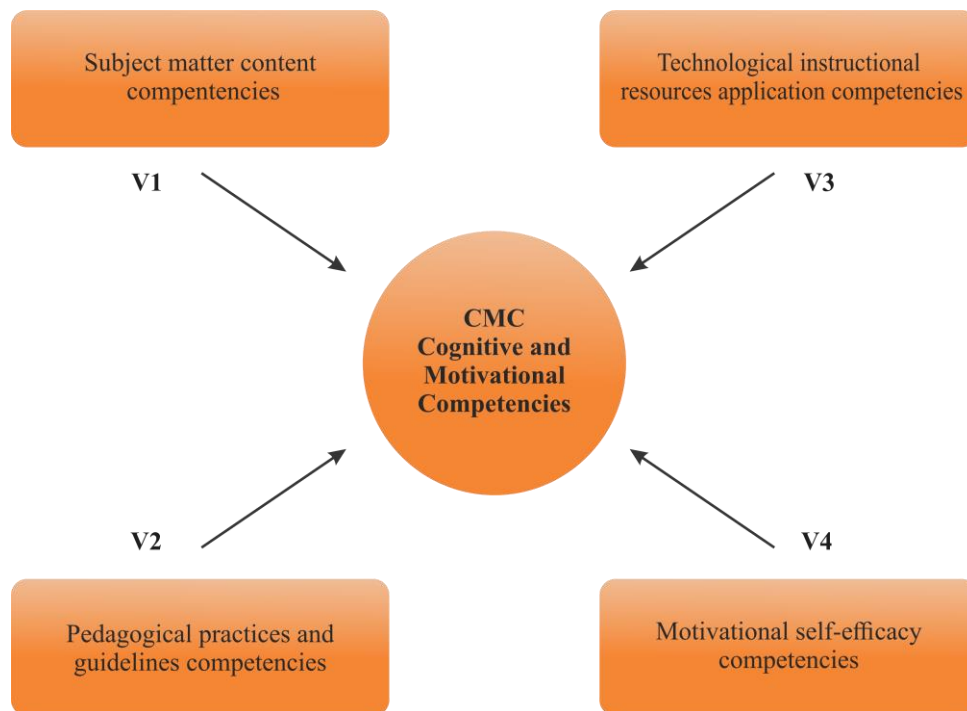


Figure 5: Domain of cognitive and motivational competencies adapted by the Authors.

Note: Motivational and self-efficacy (Bandura) are included in the TPACK components.

However, studies show that there is something more fulfilling in the profession and that a motivational process explained by Social Psychology, seen in Bandura (1995; 1997; 2000; 2001; 2008) in which the potential existence of a meaning aimed at the search for self-efficacy is present in human capacities and can mobilize the will in the search for better performance. Indeed, the humanization process of people is highly motivating for countless teachers, despite all the obstacles, difficulties, and lack of recognition on the part of society and the State.

The motivational element for self-efficacy appears in the research because of the well-known and unchanged environment of wear and tear involving teaching life, due to the natural demands and comparative and heavy difficulties against the lack of attention to the career and its motivational components in almost all senses, notably for basic public education.

The ICC started to figure as the conceptual model of incorporating technology in educational processes containing the variables related to integrated cognitive competencies and was further added by the variables that contemplated the construction of additional constructs linked to behaviour favourable to technological use, as well as to the infrastructure issues,

readiness for user profile and institutional culture characteristics of broader educational environments such as the National Education System taken as an evaluative case.

Because of this, the models available in the specific literature of consecrated use for these purposes were studied and used: TOE - Technology Organizational and Environmental Framework (Tornatzky & Fleisher, 1990); Institutional Theory (Christensen and Scott, 1995; Scott, 2001), and UTAUT - Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003), whose characteristics and history of use have been included in the theoretical framework and will be presented and justified in the chapters specifically where applied.

An initial model was presented and discussed during the Qualification test for the sequence of studies, as shown in Figure 6. establishing the following dimensions and initial study hypotheses:

- H1: CCI - Integrated cognitive competencies: perceived teaching performance
- H2: TOE - Technology Organizational and Environmental framework: organizational factors.
- H3: IT - Institutional Theory: institutional prerequisites prevalent in the organizational teaching system.
- H4: UTAUT: Unified Theory of Acceptance and Use of Technology: intentional teaching behavior for technological adoption.

Thus, an alternative theoretical model for adopting technology in large-scale educational processes is shown in figure 6.

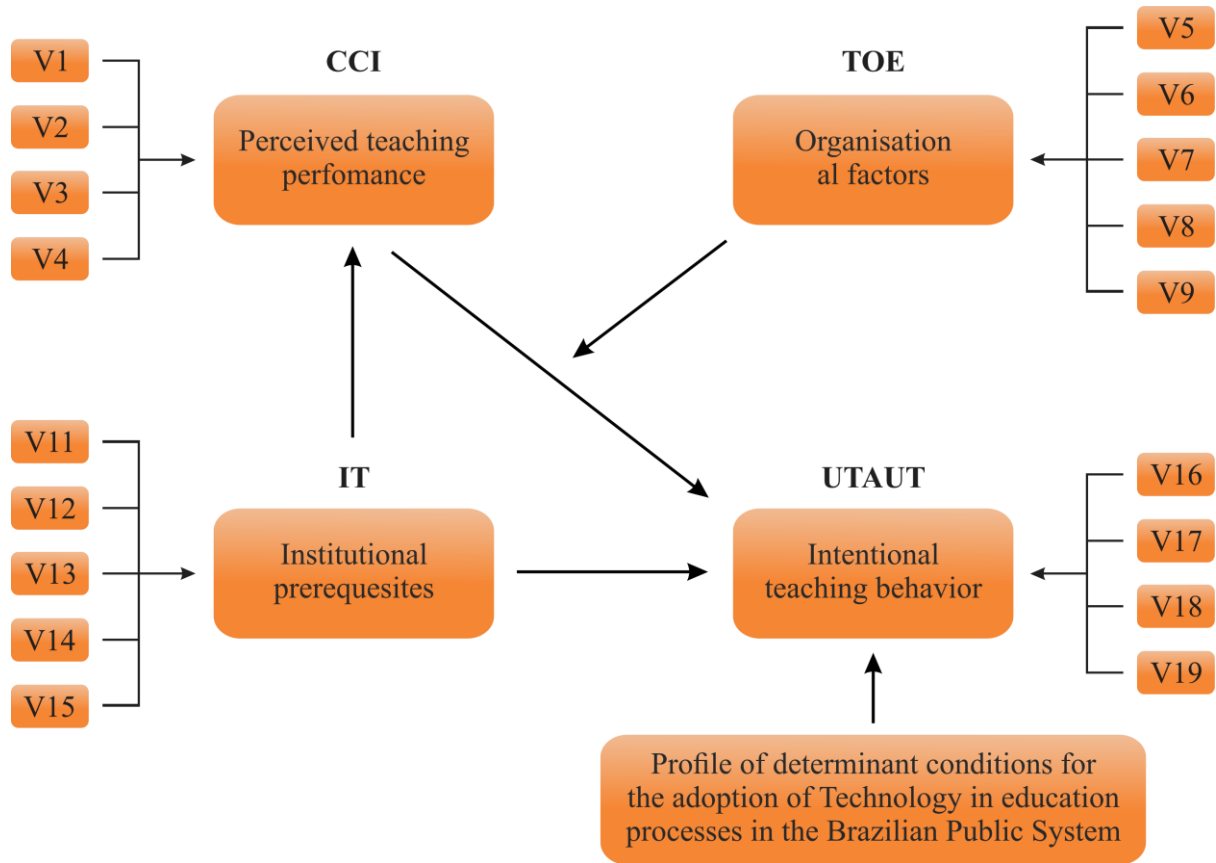


Figure 6 - Alternative conceptual model with the contextual conditions to be tested.

Note: Authors CCI inspired by original models (TOE, IT, UTAUT) as mentioned in p.16.

Figure 6's Measurement Indicators list

V1 Perceived teaching performance	V11 Institutional isomorphism
V2 Pedagogical domain	V12 Normative pressure
V3 Technological domain	V13 Quality standards
V4 Content domain	V14 Institutional planning
V5 Technological readiness	V15 Shared decision process
V6 Teacher's tech. Competencies level	V16 Performance expectation
V7 Finance resources management	V17 Effort expectation
V8 Regional differences respect	V18 Social media and networking influence
V9 Institutional pedagogical planning	V19 Facilitating perspectives of teaching work

Constructs and author's names in figure 6

TOE	Technology Organizational and Environmental Framework (Tornatzky Fleisher, 1990).
CCI	Competencias Cognitivas Integradas (Wiziack, J. C. & dos Santos, V.D., 2016) as adaptation of the TPACK (Khoeler e Mishra, 2007).
IT	Institutional Theory (Christensen & Scott 1995, Scott 2001).
UTAUT	Unified Theory of Acceptance and Use of Technology (Venkatesh et al. 2003).

As part of the methodological strategy, the following evaluation techniques were adopted in the works that formed the thesis:

1.5.1. DSR – design science research

DSR - Design Science Research was adopted due to its broad applicability in Decision Information Systems, in line with the guidelines obtained in studies and observations of several prominent authors on the main concepts and practices of the DSR. According to Dresch, Lacerda & Junior (2015), the instrument seeks to consolidate knowledge about a project and development of solutions to improve existing systems, solve problems and create artifacts (which can be constructs, hypotheses, descriptions, explanations, or actions), which result as a kind of knowledge, as things should be. Accordingly, the concern in the present study is how the question can artificially address (Simon 1996) and designed to solve a known and worrying problem in the sphere of educational management.

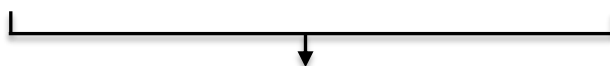
Although it is a relatively recent method in its practice, with open and developing criteria and forms of evaluation, it is considered an established method in the literature, even though it is in an open stage of maturity. (N Prat, I Comyn-Wattiau, J Akoka, 2014). These authors also argue that DSR in IS research aims to assist in creating models, also called artifacts, to solve practical questions of life. Despite recent use, and with applicability criteria presented in a fragmented and incomplete way, the authors contribute by offering an inductive study of 26 articles published in the last five years.

This study presents a holistic view of the evaluation criteria and generic methods derived from observations of the general theory of systems as an organized whole. The parts are related, which generates emergent properties and has some purpose.

In Hevner et al. (2004), in an extensive methodological study focused on applying DSR, we verified conceptual similarities of great support to the applicability of this research. In the comparative summary of table 7, we can clearly see that the organizational and behavioral paradigms involve the environment of the studied process - the educational system - with much emphasis on the question where the result will depend on the performance and motivations of the people submitted to a model organizational structure and institutional structure submitted to a management system.

Hevner et al (2004) and Decision information systems

<i>Aplicability in Information systems</i>	<i>DSR Aplicability in CCI</i>
1. Most research involves questions about Behavioral Sciences and Design Science	1. Integrated Cognitive Competencies refer to people's knowledge, skills, and attitudes, while one of the three dimensions is researched
2. The behavioral paradigm of science seeks to develop and verify theories that explain or prevent human or organizational behavior	2. The CCI dimension is based on Albert Bandura's Social Cognitive Theory and pedagogical concepts by Paulo Freire, Lee Schulman, and others.
3. The Design Science paradigm seeks to extend the boundaries of human and organizational capabilities, creating new and innovative artifacts	3. The artifact constructed in this study considers human capacities and motivations aligned with the technological structures and resources applied in an organizational environment.
4. Both paradigms are fundamental in the SI, as this issue is at the confluence of people, organizations, and technology ¹	4. The construction and implementation of this project will mobilize a large Educational Management System involving individuals, organizations, and technology



The main study aims to test an artifact model that best represents a strategic path to manage technology adoption in the Brazilian Learning System, considering the principles and isomorphism present in the highly complex national organization.

People, Organisation, and Technology

Figure7. Crossing concepts DSR applicability in CCI and Information systems.

Note: Authors based on Hevner et al. (2004) study.

Design Science focuses on creating artificial systems, solving issues through constructing and evaluating artifacts that represent the needs and solutions identified in the studied businesses and real-life problems. (Hevner et al., 2004). Justifying the set of methodological activities employed in this study, the following parameters were considered principles that will guide the step-by-step development of a subsequent planning process through the central hypotheses evaluated in the CCI model - integrated cognitive competencies. They are:

- The school's social and institutional challenges, given the reinterpretation and preparation of teachers through the renewal of curricula;
- Solving problems holistically and systematically, taking into account the dimensions involved: objective, environment, structure, activity, and evolution;
- Restoration of converging concepts for the application of a cyborg pedagogy that is better suited to education today and in the future, considering the educational cycles and their respective specificities for the coexistence of human and non-human resources in the constant updating of knowledge;
- To act in a transdisciplinary, democratic, and participatory way, guaranteeing a vision of all the projected dimensions - people, organization, and technology - so that the production of the resulting knowledge can postulate the practical use in the Educational System.
- Expository instantiations: at this point in the methodological application, we must take care of the strategic planning of the communication (Peffer et al., 2007) of this project to transform it into a prescriptive solution to be incorporated into the Brazilian National Education Plan (PNE) in its regional discussions phase. Although it is not possible to describe the details in this thesis, the steps to be followed initially imply awareness of available contents and objectives through an article already submitted to the national academic community. Besides presenting a specific project in line with the PNE norms for the Parliamentary Education Commission of the National Congress, we will be participating in a Regional Commission of the State of São Paulo in 2023. The process of this project is to transform it into a prescriptive solution to be incorporated into the Brazilian National Education Plan (PNE) in its regional discussions phase. Although it

is not possible to describe the details in this thesis, the steps to be followed initially imply awareness of available contents and objectives through an article already submitted to the national academic community.

1.5.2. Focus Group technique

Focus groups originated in clinical psychology as a tool to help researchers understand how emotions, associations, and motivations influence human behavior. Subsequently, contributions emerged with its use in marketing research to assess consumer perceptions about prices, products, brands, reactions to ads, and other things related to consumer behavior, which continues today (Stewart & Shamdasani 2014).

Adopting the focus group technique by the marketing community has already supported many projects, avoided commercial disasters, and improved results through a better understanding of the consumer's attitude (Langford & McDonagh, 2003).

According to Paez, Bobowick & Liu (2017), changes in the history of education and the social context influence how people remember past events. Biases can sometimes determine what is historically significant for those in power at the time.

In our research, the participants in the focus group below (36 members) are experienced professionals with high moral autonomy and capable of dealing with the conflicting situations of the recent Brazilian environment, even inundated with debatable texts due to the existence of false productions. Therefore, the participation of these focus groups gave full assurance and endorsement to the quality of the conclusions. All are experts in the issues evaluated.

Focus groups:

- Focus Group GEPEM - Study and research group in moral education, with researchers and educational consultants belonging to UNESP - State University of São Paulo, Rio Claro campus, SP and UNICAMP, State University of Campinas, SP. Total participants: 19 PhDs.
- Focus Group City Hall of Valinhos: Teachers and Educational Coordinators: Total participants: 6
- Focus Group CEACOM - Centre for Evaluation and Measurement in Communication and Marketing.: researchers, teachers, and consultants working at the School of Communication and Arts at the University of São Paulo: Total participants: 12 PhDs.

1.5.3. Individual interviews

- *General Teaching Coordination* of the Municipality of Valinhos, SP: a general approach to teaching management conditions and technology in the teaching and learning processes.
- *Coordinating teachers* of the Informatics Laboratory at Escola Inovati - Valinhos community school, SP (2): approach on the stages of progress in the use of technology in teaching and learning and the level of acceptance and use by teachers.
- *Ms. Teacher and consultant* in market research at CEACOM; contributions with critical evaluation of the model and content of the questionnaire applied to students of Communication and Marketing at the School of Communication and Arts of USP - São Paulo University

1.5.4. Prospective questionnaire

- Applied to students, ex-students of the Management Course in Communication and Marketing at the School of Communication and Arts at the University of São Paulo, with 170 students, obtaining 76 respondents. We used the Likert scale model constructed of predictors focused on assessing the respondents' level of agreement on the competencies of behaviors and processes used in Communication and Marketing. In this sense, the researchers already expected a shallow level of non-concordant responses.
- According to Lee J.W. et al. (2002), an application strategy with only four alternatives has been previously tested with respondents familiar with the researched subject in the same way as in the present study. The option sought greater assertiveness regarding the manifestation of the respective levels of agreement.
- A previous evaluation of the questionnaire by a research specialist raised risks with difficulties in some questions due to the complexity of the question and the level of knowledge required to answer them.
- After improvements, we applied these to the chosen sample. We included Control data in the questionnaire to outline an anonymous profile of the respondents, but without any correlated statistical treatment, except to subsidize

eventual comments raised in the Focus Group. See the basic questionnaire applied in Appendix B.

1.5.5. SEM- Structural Equation Modelling

This research applied structural equation modeling (SEM) to the quantitative evaluation as a multivariate statistical modeling technique widely used in the Humanities and Social Sciences. It is a combination of factor analysis and regression or an extension of these to analyse trajectories or paths (Neves, 2018).

The most established use is for studying causal relationships between sets of observed variables. However, there are three assumptions for establishing causal relationships: temporal sequence (predictor preceding the variable to be foreseen); concomitant variation (variable to explain/predict should vary along with the explanatory variables. In this case, the covariance between the explained variable and its predictors should be significant, in addition to eliminating mitigating variables to remove factors that may confuse the causal relationships. (Coelho and Vilares, 2005).

Structural equation modeling with partial least squares estimation in the areas of social sciences and behavior is useful for evaluating relationships between constructs (or factors, components, latent variables, unobserved variables, subscales, etc.), as it is robust to multivariate normality and is viable for small samples (less than ~ 100 cases), aspects very present in the use of attitude scales (Bido & Silva, 2019).

Quantitative data were analysed using structural equation modeling (SEM), with latent variables and hypotheses for statistical calculations tested using Smart PLS (partial least squares). According to Hair, Joseph, et al. (2016), the method is advantageous because it has many constructs that refer to a model composed of measurement variables that analyse predictions of human phenomena such as attitudes and perceptions, factors that have already been shown to be convincing for our choice.

1.6. Thesis organization and structure

The strategy defined for the presentation of the thesis was to divide it into four blocks, which coincidentally demonstrate its evolution over the study period and consolidation of the following phases:

1.6.1. Introduction

Organizational formalities, motivations, justifications, awareness, and problem definition. The maturing of ideas consolidated a title - as if it were the name of the film to be produced, in addition to a summary script showing the provisional trailer for the film: ICC - Integrated Cognitive Competencies and Transformative Pedagogy for incorporating digital technology in educational processes. Opportunities were created for writing articles and submissions in Congresses and journals with a view to learning and building the thesis around this theme.

1.6.2. Methodological validation

This was followed by constructing a basic model of technological adoption in educational processes for validation exercises through articles and submissions in journals and international congresses. At that moment, the methodologies in their practical applications were analysed, opting primarily for DSR - design science research, with a focus group discussion technique composed of education specialists. In one of the articles, the quantitative methodology was applied using Smart PLS 3 and constructs established in a causal relationship by evaluating Indicators for measuring variables obtained through a questionnaire on a Likert scale. The details and justifications will be presented locally at each stage of the thematic discussions centred on articles published from the thesis.

1.6.3. Conceptual framework

In figure 7, there is the schematic development of the reflexive, critical, and conclusive theme on the issues and conceptions that involve the educational process of humanization of society, its epistemological complexity, and the diagnosis of the cultural mismatch and delay created by the trampling of social transformations generated with the advent of the new ecology of networked life and the digital communicative revolution.

The strategy was to develop a dialogue between authors before and after the digital communicative revolution, seeking to understand the impacts of the educational process and the relationships arising from real-time communication. The themes mentioned are linked and/or exposed in the articles created.

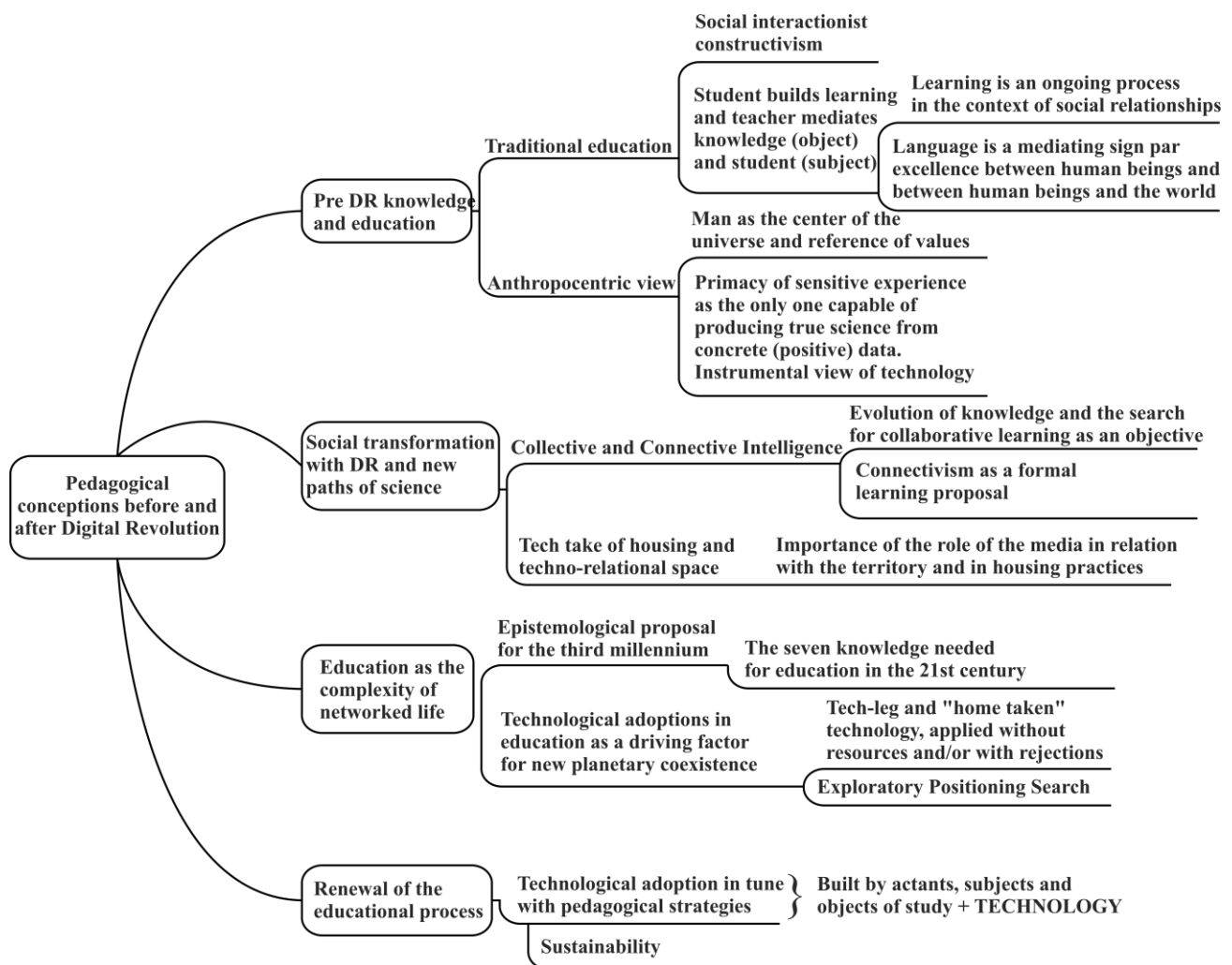


Figure 8: Conceptual reflexive framework on themes related to before and after the digital revolution.

Note: Authors suggest reflexive pedagogical conceptual thought

1.6.4. Conclusions, reflections, and new paths.

This last block essentially addresses the conclusions of the thesis in addition to reflections and proposing new paths for the educational development of true planetary citizens, in addition to raising awareness of the need to overcome the limitations that will always be present in the context of network life. The contributory synthesis of this session should demonstrate the validity of the evaluated paths and arguments for using ICC - Integrated Cognitive Competences and Transformative Pedagogy for incorporating digital technology in educational processes. The final word is the space to recognize what has been achieved in

concrete with the research and especially what can be done with it to add value to the Brazilian Educational System, notably in the face of the needs and opportunities caused by the Covid 19 pandemic and the severe crisis imposed to the country by the wrong choices of the current government.

Chapter 2: Reference themes and constructed articles

The ongoing communicational transformation with digital technologies and the increasingly widespread intertwining of reticular ecosystems, deepening effects and changes in social life, defining new forms of relationships. Therefore, the renewal of the educational process is essential to understand and assimilate the connections between the themes that link this complex phenomenon. In other words, this means that part of this renewal starts with the need to accept the challenge of knowing the technology and its effects and benefits. The following considerations show that technology does not choose learning theories for the best fit. Constant innovation shows day by day the best uses of technology as a learning tool; by incorporating them, we develop ourselves and are reborn. (Kerckhove, 2009).

2.1. Connections between philosophies, learning theories, and ICT¹

This chapter addresses an analysis of the educational process scenario in terms of its practices and trends in the incorporation of information technology (ICT) in education, considering its complexity and the technological adaptations of use in the main learning theories that emerged during the last century.

The current international literature offers a series of different technological applications for use in the classroom, from PowerPoint, audio, and video podcasts to isolated methodologies of a pedagogical model, which are very useful even for interdisciplinary employment. However, the correct application consistent with the respective pedagogical project is up to the teacher (Brady, Holcomb, & Smith, 2010; Craig & Amenic, 2006; Copely, 2007). This facet corroborates the understanding that the challenges for technological use in education go beyond infrastructure and skills in its use.

¹ Theme presented in the article “ICC - integrated cognitive competencies for incorporating technology into educational processes,” published at the 12th Contecsi- International Congress on Technology Management - FEAUSP proceedings.

Making pedagogically appropriate and compatible use is essential to improve the learning process. For that, we need to overcome the challenges related to enhancing technological adoption in this direction. Therefore, it is necessary to understand the learning theories developed throughout the 20th century and their connections and compatibility with today's technological tools.

From the dominant pedagogies, naturally conforming, applied to the colonial process in several countries, the theoretical references led to the second half of the 20th century, meeting new theories, notably with the constructivism of Jean Piaget, broadening the perceptions about the genesis of the creation of knowledge and forms of learning.

Constructivism, also known as cognitivism, appears as the most accepted (but not necessarily most applied) learning theory in the world educational scenario. As a reference, only in the Science Direct, Eric, and EBSCO databases, there are about 161 studies on constructivism published between 2002 and 2013 (Gunduz & Hursen, 2014).

In Piaget's theory, each student builds their own learning in an inside-out process, in which psychological background experiences bring the subject and the object into interaction. Consequently, according to the constructivist position, knowledge is not a copy of reality but the construction of the human being (Carretero, 1997). In Piaget and Vygotsky's constructivism, "the teacher is a mediator between knowledge (object) and the student (subject), favouring the dialectical relationship between both" (Weisz, 2002, p. 23).

Constructivism has become a theory of learning widely adopted in most educational centres worldwide. In Brazil, for example, it is an integral part of the Curricular Parameters of Brazilian Education, without, however, effectively achieving the results in practice due to the lack of conceptual understanding of teachers and the lack of management and application of public policies in an effectively planned way. Understanding technological application requires the teacher to previously master the understanding of the pedagogical foundations to establish the relationships with the teaching instrumentalized by the ICTs.

In the case of constructivist pedagogical application, this becomes more careful. In addition to active social and creative learning, different knowledge calls for different constructivist responses and not a standard action model (Perkins, 1999). In *Constructivist Essays* (1994), Lino de Macedo points out that the cognitive development of the Piagetian

subject occurs based on the assumption that there is a conjuncture of interdependent relationships between the knowing subject and the object to be known. This involves a complexity of factors that intertwine and complement each other, such as the maturation process, the interaction/experience with the object, the social experience, and, mainly, what Macedo calls balance in the environment.

Osborne (1993) draws attention to the fact that the central core of the concepts of modern science is symbolic representations and not sensory experiences. For this author, most of the proposals for constructivist teaching place “a considerable emphasis on the value of observation and direct experience, that is, an empiricist perspective of learning science, and do not sufficiently emphasize the process of acquiring new structures to reinterpret the experience. And transcend common-sense thinking ”(Osborne, 1993, p. 4).

On the other hand, according to Chin-Chung Tsai (2004), using the internet as an epistemological tool constitutes the search for knowledge through metacognitive techniques. That is, knowing how to learn from the subject is consistent with constructivist practice. He adds that his use reveals a broader view of teaching and learning and encourages teachers to perceive the internet as an epistemological instrument. We learn and interact through technologies that put us in contact, such as Skype, Google, Hangouts, videoconferences, Facebook groups, WhatsApp networks. Instagram, meetings, teams, and Zoom, etc., are already incorporated into the social relationship and naturally transferred to the school environment.

In the interactions set on the internet, knowledge is built in a network based on everyday life and linking knowledge with social practice by the exchange, multiplicity, and complexity of relationships and the sharing of meanings. Thus, knowledge arises from the networks of relationships in which people share meanings (Libâneo, 2005). Science and common sense are mixed in the learning through the contradiction between valid knowledge and everyday knowledge, whose coexistence ends up allowing the formation of the real social subject in opposition to the idealized by the school (Bruner, 2002).

There is also the positioning of Papert (1985), presenting his language “Logo” as a construct of Piagetian background, about which Yves de La Taille, in his essay on the Place of the Computer in Education (1990), lists the following convergences: “The child is seen as a

builder of his mental structures”; “A cooperative environment is essential for the child's development”; “One learns from mistakes” (La Taille, 1990, p. 206).

Research using podcasts strongly linked to the pedagogical process - controlled by the institutional learning management system - showed good results in the students' performance, to offer the opportunity to control application, reflection, and individualized and self-controlled learning, however within a constructivist learning environment (Angeli & Valanides, 2009).

Likewise, a recent publication on smartphone use research with undergraduate students confirmed the hypothesis that the results are more positive when pedagogically oriented despite the potential for use. On the contrary, when they remained under free use by students, smartphones served as a distraction factor for the entertainment offered (Rahmati, Shepard, Tossell, Zhong, & Kortum, 2014).

Other pedagogical ideas also born far from digital influence converge in the prospect of a new way of educating in the future, democratic and based on the concept of education for citizenship. One of them comes from Paulo Freire, whose conception of “teaching is not transferring knowledge, but creating the possibilities for its own construction” (Freire, 2003), reaffirming the pedagogical alignment of the use of technology in learning according to the constructivist theory, as summarized in table 1.

Table 1:- Constructivism by Piaget and Vygotsky. Author’s suggestion to think relations among foundations, students, and teaching role with ICTs

Philosophical foundation	Knowledge is the construction of the Human Being in time and a dialectical relationship with the object. However, interrelationships are considered by Piaget himself as evolutionary Kantism, inverting apriorism with constructivism and the recognition of affectivity. (Oliveira, 2004; Freitag, 1989, Piaget, 1959 apud Ramozzi-Chiarottino 1984).
Pedagogical foundation	Active, social, and creative learning. Interdependence and interaction between the knowing subject and the object to be known. Learning involves change. (Piaget 2003; Macedo, 2004; La Taille, 1992; Becher, 1992)

Student role	Learning builder. Active participant and collaborator. Dynamic interaction with extensive media. Interest, ability to use information already known to establish relationships necessary for the learning sequence. Use of metacognitive techniques of learning to learn. (Carretero, 1997; Chin-Chung Tsai, 2004)
Teaching paper	Mediator between knowledge (object) and apprentice (subject): influencing or creating motivating conditions for students; creating problem situations; encouraging the acquisition and recovery of previous knowledge; creating the process and not the learning product. (Weisz, 2002)
Role of ICTs	Extension of the constructor subject. Search and process information as facilitator and co-author of construction (Siemens, 2017; Lemos, 2013)

Piaget (2003) observes that the behaviourist approach, developed by Watson and Skinner, is based on the concepts of stimulus and response when studying the human being due to the associations established between stimuli in the environment and the responses produced by his behavior. Skinner considered stimuli or inputs and observable responses or outputs by looking only at direct relationships, without concern for internal connections.

The clearest example of this technological use in education was the adoption of programmed instruction as an application of operant conditioning. This technique splits the content into stages of easy and increasingly linked responses, having the learning process reinforced by immediate responses whose hits are rewarded (Piaget 2003). In behaviourism, learning is achieved through doing and repeating. A classic example is the various types of simulators, widely used in more complex technical learning and E-learning, whose epistemology has been studied by researchers since the early 1970s (Marshall & Cox, 2008). One of the main bases considered by behaviourists is that learning takes place from the outside in, incrementally from the ease of repetition and reward. The knowledge seen in this light would be a reproduction of reality (Dede, 2008).

On the other hand, in contrast to behaviourism, cognitive psychology is centred on the process of “understanding, transforming, storing and using the information involved in the cognition plane” (Santos, 2000, p. 101). This way, analysing the mind and cognition and how the world of meanings is initiated is proposed. E-learning, whose learning takes place in a

predominantly solitary and introspective form of study, is characterized as a technological example of this application.

According to the theories of Maslow and Rogers, humanism contributes to learning through motivational factors and a sense of responsibility in students. Guey, Cheng, and Shibata (2010) point out that Maslow (1943) and Rogers (1959), with their theories of the hierarchy of needs and the centrality in the student, respectively, demonstrated that humanistic learning differs from cognitivism by placing a focus on needs and individual values, privileging the reasons for learning instead of how and what to learn. In this line, the spontaneity of apprentices is touched on by the success and search for knowledge and when it allows them to take responsibility for learning. On the other hand, in contrast to behaviourism, cognitive psychology is centred on the process of understanding, transformation, storage, and use of information involved in the cognition plane. (Santos, 2006).

2.2. Digital communicative revolution and social transformations

The forms of human communication, heavily influenced by the internet and its connective derivations, allow access and participation in various social and political instances and facts, producing a new way of being, behaving, and learning. Paulo Freire already showed the strength of the idea of “education as a practice of freedom” when he said that “no one teaches anyone, nor does anyone educate themselves, men educate in common, mediated by the world” (Freire, 1979, p. 164).

Since McLuhan's observations on the social function of the media, when saying that “societies have always been influenced more by the nature of the media, through which men communicate, than by the content of communication” (McLuhan, 2007), behavior social has been clearly changed with the immersion in the network life, which also substantially affects the learning process through virtual contact and instant knowledge of facts and information.

The internet has become an ocean of possibilities for obtaining knowledge and an intelligent learning environment. By allowing the possibilities of formatting and reformatting some exploratory models for the conceptualization of new experiences, internet users walk along with the steps of cognitive, metacognitive, and epistemological experience in constructing knowledge (Chin-Chung Tsai, 2004), thus aligning themselves with constructivist theories.

The conceptions of new forms of learning in the digital age were preceded by the emergence of Pierre Levy's concepts of collective intelligence, mainly when relating social ties to knowledge, showing the concept of intelligence as “working in common agreement” for the future society (Levy, 2007).

Kerckove (2014), in the *Architecture of Intelligence*, also presents the idea of connective intelligence, which brings together the spatial dimensions in which we live today - mind, world, and network - contributing to the setting of the real lived for the new learning necessary to a new dwelling today and, mainly, in the future.

The frontal perspective at this moment is the social transformation resulting from the digital revolution and the new understanding of the ongoing communication process within a much more immersive or “habitual” logic of information transmission (Di Felice, 2009). Our study is located in a time and space where we are in a network of networks, in a dialogical perspective that specifically addresses relationships in reticular contexts, understood as processes of changes in all participating members and not in simple mechanical exchange of information. Santaella (2004) points out that it is no longer a question of thinking about external information flows interfering with the individual, nor just an articulation of information flows between senders and receivers; in the new context, the author understands that:

The sender no longer sends messages but builds a system of navigation routes and connections; the message becomes an interactive program that is defined by the way it is consulted so that the message changes as it meets the requests of the person who manipulates the program and even though the receiver becomes a user and organizes his navigation as he wishes in a field of possibilities whose proportions are large enough to give the impression of infinity. (Santaella, 2004, p. 163)

In the context of the digital revolution, we must also point out the emergence of the learning theory of Canadian George Siemens (2005), connectivism, seen as an active part of this discussion.

In his article *Connectivism: a learning theory for the digital age*, the author presents his theory and lists some significant trends in learning:

- Many students will go through various fields, possibly different over the course of their lives. Informal learning is a significant aspect of our learning

experience. Formal education no longer comprises most of our learning. Learning now takes place in a variety of ways;

- Learning is a continuous process throughout life. Learning and work-related activities are no longer separated; they are the same in many cases. Technology is changing our brains;
- The tools we use to define and shape our thinking. I can now download many of the previously dealt with by learning theories (especially in cognitive information processing) that can now download to technology-aided devices;

Stephen Downes (2005), in several texts discussed in Mota (2009), complements, and contributes to the Siemens theory by presenting the idea of distributed or connective knowledge by saying that:

- For two entities to be considered connected, one must lead to or become the property of the other: the knowledge resulting from such connections is connective;
- To know something is to be organized, showing patterns of connectivity.
- Learning, for an individual or community, is to acquire certain standards built by the community's own participation;
- Learning is essentially a conversation between the apprentice and other community members through words and multimedia in a rich and interconnected architecture.

Besides, according to Downes' criteria, for networks to be considered “knowledge networks,” they must have diversity, autonomy, interactivity, and openness as characteristics, being called by him effective networks when they have eight properties: decentralization, distribution (entities residing in different physical locations), disintermediated (without a barrier between source and receiver), disaggregated content (in units as small as possible and unbound content), disintegrated content and services (entities in a network are not components of each other), democratic (autonomous entities to negotiate connections), dynamic (fluid entities with the creation of connections as an essential function) and inclusive (example: when learning there is no need for specific tools, therefore serving the same ones that are used in everyday activities - in this case, Downes only refers to the fact that learning, given as an example, does not require a separate domain).

Siemens' connective proposal is a pedagogical form of a new communicational ecosystem outside the frontal proposition of teacher, classroom, and student, which it does not eliminate, but overlaps.

Teaching and Learning are related to communication and, therefore, with implications for each other (Pireddu, 2014). Educational institutions have not yet appropriated technological opportunities and pose themselves as an outside world.

The media of the past and the present have changed the way of recording our experiences. They have contributed to the reconfiguration of modalities for knowledge storage, diffusion, and production. This needs to be understood as a difference between the diverse ecosystems and their complexities.

2.3. Education as contemporary complexity

One way to seriously focus technological impacts - as suggested by Castells (2000) - on educational processes can be to start by understanding their complexity. We have chosen Morin's framework in this approach because it represents a shared contribution by educators from almost all parts of the world, united around the document "The seven-knowledge necessary for the education of the future" (Morin, 2001), developed at the request of UNESCO at the turn of the millennium.

The epistemology of complexity centred on the form developed by Edgar Morin is due to the intention to get to know it better as a presence in the educational process and in-network life and, in this way, to interpret the conflicts and uncertainties present in these spaces.

The term complexity carries a semantic load of confusion, uncertainty, and disorder and cannot be understood at first. Morin says that the complex cannot be summed up in a keyword and reduced to a simple law or idea: "Complexity is a problem word and not a solution word" (Morin, 2007, p. 65).

Etymologically, complexity comes from Latin, *complexus*, which is woven together from heterogeneous elements in a state of association. However, mistakenly, it was understood to seek an understanding of complexity from the simplifying paradigm to order the universe by eliminating disorder (Morin, 2007).

According to Morin, order is a law, a principle. Simplicity sees only the one, but not if it also contains the multiple because it separates what is connected (disjunction) or unifies what

is different (reduction). It exemplifies the way we study man himself: the biological being studied in biology, the cultural man in the humanities and social sciences departments, and also the brain as biology and the mind as a psychological function (Morin, 2007).

According to the author, there was evidently a sense for this, and face to this revelation of the simplicity hidden behind the apparent diversity and the apparent disorder of the phenomena, many discoveries took place. However, disorder and chaos are part of the same process. In this sense, complex thinking did not replace the idea of simplicity and thus took care of the real. On the contrary, it is a thought that dialogues with the real. That is, it is capable of understanding and acting multidisciplinary.

Fragmented knowledge prevents the vision and the “link between the parts and the totality” needing to be reviewed and exchanged for a way of apprehending objects within their contexts and complexities (Morin, 2001, p. 14).

Taking as an example the complexification experienced by large organizations (as well as the educational system on screen), the key to survival is creating conditions and preparing while establishing actions to understand the process and change strategies to new heights (Stacey, Griffin & Shaw, 2002). In fact, this means living in constant change and keeping in mind that just as organizations must be reconceptualized as non-linear systems capable of facing continuous transformations, the behavioral changes brought about by technological evolution in society require the same attention to the renewal cycle (Burnes, 2005), which is undoubtedly the role of the educational process.

In the context of education as complexity, the encouragement of the adoption of information and communication technologies must consider the interdisciplinarity between pedagogical knowledge, the content of knowledge, technological knowledge and skills, and the general conditions of infrastructure and general readiness educational environment in this study. We place special attention on the concept of epistemological commitments (emphasis added) as evaluative standards to judge the merit of knowledge as its generalization, usefulness, and internal consistency in technological applications (Posner, Strike, Hewson & Gertzog, 1982).

Education should benefit students through knowledge and socialize them with norms and values while supporting their autonomous development and making them emancipated

subjects (Biesta, 2009). According to Morin (2007), the notion of human autonomy is complex, as it depends on cultural and social conditions. For this reason, it feeds on dependencies such as education, language, culture, instructional resources, etc. We are a mixture of “autonomy, freedom, heteronomy and even hidden forces that are not those of the unconscious brought to light by psychoanalysis” (Morin, 2007, p.67).

Digital communication opened the borders and fully expanded the geography of the school space. The whole is no longer the classroom and deterministic intramural relations. Future technological developments are unimaginable, updating and streamlining our humanization process, which today seems stuck in time.

The issue is the conflict of identity between the prevailing determinism in the classroom environment of the school and the potential for extending this complexity to an even more complex one, overcoming the imprint of the traditional model. Thinking about these possibilities can lead to a highly complex process of going from the conventional level to the school level of the future.

Change is decisive because if nothing changes, always remaining stable, neither progress nor the system dies. On the other hand, remaining very chaotic can be overwhelmed by change and, therefore, needs to establish a new and more appropriate set of rules (McIntosh & MacLean, 2001, cited in Burnes, 2005)

So, we also think about the complexity and action stage, another concept by Morin that represents choice and challenges, awareness of risk, and uncertainty. According to Morin (2007), action is a strategy that fights against chance, makes use of it, errors, deconstructions, drifts, bifurcations, and imposes reflection on its complexity because “action is the concrete and sometimes vital realm of complexity ”(Morin, 2007, p. 81).

The search to overcome this stage of apparent reproducibility of the traditional educational model by using new technologies inspires and allows for a total redefinition of the learning environment, living with and overcoming the uncertainties and doubts caused by the complexity traps themselves; in other words, creating new ones. Competencies result in knowing how to act, which allows navigating safely and autonomously in these networks.

Syh-Jong Jang’s (2008) account of Taiwan's economic development actions for the 21st-century show this complexity superation becoming reality knowledge-based. They

established an educational technology project for primary and secondary schools, which proved to be an excellent example of opportunity. This fact gave significant focus to the preparation of teachers through a constructivist methodology based on web-centred learning combined with written observations and reports, constituting success and differentiating the process compared to the traditional model. The Taiwan Program combined the preparation of students with the preparation of teachers and adopted a model of technological application with a pedagogical focus.

Due to the speed of technological innovations, the search for understanding the educational process as a complex system involves the immediate establishment of controlling actions for living on the edge of chaos while trying to think and establish measures that follow in line with the rapid transformations of planetary and social life. In this same way, as pointed out, large organizations are experiencing the same turbulences (Stacey, Griffin & Shaw, 2002).

Therein lies the necessary creation of new teaching and management skills for the educational process. However, taking yet another principle of corporate organizational change, it becomes strategic for practical actions that the organizational environment of Education reaches greater democratization and equalization (emphasis added) of power in all aspects of its processes instead of reduced current participation (Bechtold, 1997; Kiel, 1994; Jenner, 1998).

In the context of this complexity, there is also the new housing condition between subject and environment pointed out by Di Felice, which, in addition to being economic, political, and social, presents itself as a philosophical issue. This approach becomes necessary not only to “fully understand our contemporary condition but also to rethink, from a broader historical point of view, the relationship between man and the world around him” (Di Felice, 2009, p. 21). This relation is yet another solid stimulus for knowledge and educational renewal based on new constructions of the present for the benefit of the planetary citizen. Therefore, it is not just a matter of using new technologies in education but of seeing them beyond an instrumental value as an actor in a collaborative process to change the human-centric vision.

Libâneo (2005) points out that networked knowledge is characterized by the exchange, multiplicity, and complexity of relationships and the sharing of meanings based on daily life in which knowledge is linked to social practice. He also says that knowledge arises, therefore, from networks of relationships in which people share meanings. However, Bruner (2002)

points out that Science and common sense are mixed in learning due to the contradiction between valid knowledge and everyday knowledge, whose coexistence allows the formation of the real social subject instead of that idealized by the school.

In addition to the challenges of assimilating innovative technology, which also occurs in other fields of application, pedagogical aspects need to be combined with learning for the benefit of proper assimilation. (Khoeler & Mishra, 2007).

Paulo Freire reaffirms our understanding of the pedagogical alignment of the use of technology in learning, despite his conceptions being born far from digital influence. In saying that "teaching is not transferring knowledge but creating possibilities for its own construction" (Freire, 2003, p.12), it anticipates the phenomenon of current online learning, as well as converges to the idea of exploring a new way of educating democratically, based on the concept of education for citizenship. Thus, pedagogy reaffirms the alignment of the use of technology in learning according to the constructivist theory. Knowledge is constructing the human being in time and a dialectical relationship with the object (Freitag, 1989).

In this complexity and context, the student is also a builder and an active participant in learning. The teacher is a mediator and promoter of knowledge acquisition and recovery, creating the process and not the product (Weisz, 2002).

As an intelligent learning environment, the Internet allows users to format and reformulate some exploratory models and build knowledge through these new step-by-step, cognitive, metacognitive, and epistemological experiences, practicing and building new forms of learning (Tsai, Chin-Chung 2004). This context allows great opportunities for better-prepared teachers, facilitating the important role of mediation.

It is evident, however, that the new technological environment requires a new set of knowledge, skills, and attitudes, shaping new competencies to be learned and incorporated into the environment and life practices by gradually changing our social relationships, workplace, and, finally, life in the biosphere.

In conclusion, the conceptual justification framework summarizes the idea that technological adoption in Brazilian education goes through arguments that endorse the effort to study the challenges. Technology enables the connection bringing the global closer to the

place based on the inclusion and influence of multiple and diversified perspectives (Morin, 2009).

Isolated knowledge is not transformative in itself but necessary. The reflection that allows critical and analytical awareness about the knowledge/object presented depends on the mediation and interaction between subject and object through the school (Piaget, 2003). Technology, therefore, is not a source of knowledge but a powerful instructional and pedagogical resource that, when used in all its possibilities, contributes to metacognition, producing efficiency in learning and characterizing itself as an essential human extension that is increasingly incorporated into everyday life and our lives.

The internet as a democratic space welcomes the multiplicity of ideas, including those based on common sense and that may be equipped with prejudices, mistakes, distortions, worthless, and that, for some subjects, become truths. If, on the one hand, the internet becomes a narrative that allows coexistence and complementation of scientific thought (Bruner, 2002), on the other, it can mean alienation and distance from common sense and reflection, becoming, according to Spaniol (1989) Wittgenstein's "fly in the glass."

Finally, technology requires that the subject communicates through language or the technology itself, the basis of interaction with the machine. However, it is necessary to consider that a significant part of the population does not have this possibility because, before being excluded digitally, they are illiterate in written language and do not participate in this world. They are excluded due to a lack of reading and writing. This is the subject who is in the world without "knowing himself in it" (Freire, 2003) and, therefore, without commitment.

Still, in Freire, for human beings to have an act of commitment, they need to fulfil the condition of being able to "act and reflect" to "overcome the limits imposed on them by the world" (Freire 2003, p. 16). Education transposes this through knowledge and awareness. Concluding the comments in this section, it is necessary to clarify that technology does not eliminate or even inhibit the benefits of the human relationship of the on-site school. This aspect is not even under discussion in that study.

In conclusion, the conceptual justification framework synthesizes the idea that technological adoption in Brazilian education goes through arguments that endorse the effort to study the challenges. Technology enables the connection bringing the global closer to the

place based on the inclusion and influence of multiple and diversified perspectives (Morin, 2009).

2.3.1. Educational technology, pedagogy, and connectivity-driven learning

The scenario described by the theoretical framework points to the need to review and resolve some issues related to the contemporary educational process, notably the enhancement of the learning process through technological applications born with digital communication, however not yet contemplated by the social initiative. Litwin (1998), in a discussion about educational technology in Quartiero (2007), referring to technological development, already anticipates the reconceptualization of the world and the reinterpretation of the school curriculum as issues to be resolved

Table 2 - The pedagogical practice with educational technology. Author's suggestion to ponder.

Social technology	The physical structure of the school; architecture; division into classrooms; leisure spaces, library, etc.	Expression of culture and social choices. It is not a simple means, but a way of life. (Sancho, 1991 cited by Quartiero, 2007)
Technical resources (Quartiero, 2007)	Instructional equipment and resources; laboratories; books; communications structure; curricular proposals and changes. Technological incorporations - radio, television, video, recordings. Research, creation, development, methodologies, and evaluations of these incorporations in educational spaces.	Paradigmatic break with the globalization of the use of the Web and the emergence of search engines. Maintaining the status quo. Technology as social production (Castells, 2001) and education not yet seen in this social-cultural dynamic.
School reconfiguration	Digital communicative revolution; real-time information; electronic and computerized resources; virtual schools; digital encyclopaedias; academic network networks; e-books; applications; ICTs from social life to school life. Educational technology lagging behind technological applications, curricula, and teaching in cultural backwardness with current living and future possibilities	Run over; the speed of technological innovation out of step with educational development; technology and means transforming life into society. We need to educate for new ways to inhabit the biosphere. (McLuhan, 2007; Di Felice, 2009; Pireddu, 2013)

The academic literature presents numerous proposals and experiences of applications and technological adoptions in education in its various categories and levels of education. However, there is a lack of models which consider technological adoption in an integrated context for schools. Students, subjects, and, above all, teachers are considered in terms of competence for correct pedagogical performance effectively.

Just as a record, in a 2013 technical paper, Willis, Kestel, Granger, and Missinghan, senior academics at the University of Adelaide in South Australia, recognized that the educational process has changed due to technological advances in recent years and also pointed out several examples of suggestions applications and the consequent benefits adding value to the networking system in the university environmental context, or even the example of moodle for real-time interaction between students and teachers.

However, there is concern about the need for adequate infrastructure and training of users to improve the use of technology, as well as the concern of teachers with extra work to monitor and evaluate activities carried out via the internet (Brad et al., 2010; Dutton et al., 2004; Rutkowski, J .; Moscinska, 2015; Paechter et al. 2010). The difficulties are not exclusive to education in Brazil, and the technological adoption really requires investment and implementation planning.

The profile and teaching role taken as a central element, as well as the concepts of school management and the formulation of public policies, need to be rethought as a set of integrated actions and competencies, having the pedagogical project that represents the social desire for the school role as a constructive basis. A model of technological adoption was already found, as presented in the methodological studies of session 1.5. and would be submitted for discussion and approval at an International Congress in Spain on scenarios and strategies.

Chapter 3: Transformative pedagogy as a response to technological humanization ²

Teaching and learning are part of the same process, before and mainly in the context of contemporary digital culture. As mediators and disseminators of digital technologies in learning environments, it is up to teachers to properly apply digital technologies and develop new competencies for themselves and students in the face of new ways of learning. In this context, the Pedagogical strategies combine with the teaching and learning technologies enable the teacher's new competencies and represent the driving factor of transformations in learning.

3.1. Introduction

This chapter suggests reflections on the contemporary educational pedagogical process, assessing the need for adjustments to the speed of learning with cultural changes in the era of the Information Society. With exploratory methodology, in this theme, we use authors who provide the opportunity to reflect on the generation of pedagogical ideas in line with this social transformation. The dialogue with the arguments raised, supported by Focus Groups with specialist teachers, leads us to conclude that the current Teaching-Learning environment requires cognitive deepening in the face of computational interaction and new skills for a dynamic teaching role in the techno-relational interface of contemporary humanization.

In Digital Humanities, we can understand that the term “digital” modifies or qualifies the noun in some way by establishing a direct relationship with the effects of digital technology. The digital aspect is thus incorporated into heuristic possibilities for finding solutions to issues through these technological resources. Thus, we align ourselves with the concepts of the text Manifesto for the Digital Humanities as a term that identifies the set of Human and Social Sciences, in addition to Arts and Letters (Dacos, 2010).

² Article published in Risti entitled: Transforming Pedagogy and Relearning in the Digital Humanities.

The desired and necessary humanization process is deeply affected today by the way we communicate and live in the age of the information society (Castells, 2000), knowledge (Hargreaves, 2003) and learning (Hargreaves, 2003; Pozzo, 2004), times when there are great difficulties in keeping up with the rapid development of digital technology and at the same time assimilating and converting information into knowledge.

Education and relearning for contemporary and future life occupy a central position in the content of this discussion, given the condition of a process of humanization and social practice that inserts the individual into living with collectives. However, the study focuses on deepening the knowledge of the challenges in the appropriate adoption of technological resources in a pedagogically effective and up-to-date way, in line with the constantly advancing technological revolution.

When justifying the suggested critical reflection on transformative pedagogy, we look to Saviani (2008, p.422) for a profound concept and in line with the problem of our reality when saying that “educational work is the act of producing, directly and intentionally, in each singular individual, humanity that is produced historically and collectively by the group of men.”

It is a holographic view in which an intentional model centred on the school acts on the cultural elements that need to be assimilated by individuals for them to become human through the best ways of achieving this goal. This first apprehension of how technology can help us become human is interesting.

It is observed that these ideas refer to pedagogical concepts about education that are valid for the various techniques and learning methodologies currently applied, regardless of the political-ideological character of the context in which they were born, just for the meeting of political-philosophical intentionality with the better instructional alternatives offered by the new techno relational context we are experiencing.

This means that just as it was before and that it will continue to persist in the future, pedagogy will be the formatting of concepts, ideas, and instruments that will best answer the question about what kind of humanity we want to build and, for that, what education we need a plan for the kind of citizens we want to be. (Saviani, 2008; Giroux, 1999). In addition to

Paulo Freire, these authors strongly remind us that Education is, above all, a political act that must represent the choices of society.

In other words, it must be a form of humanization of Pedagogy democratically defined by the majority and not simply imposed in any way by each government that takes control at a given time. For that, the basic principles and rules of Education appear in the main charter, and certainly, there are its pedagogical principles.

In this session, authors and critical experts working in Brazilian and international education comprised a Focus Group discussed the issues that arise in the search for a new professional identity for the teacher, as well as validating an alternative model for better understanding and application of technological use in the teaching and learning processes. The place of Pedagogy is discussed in the humanization process under the influence of the environment of the information society, knowledge, and learning characterized by informational behaviour and the new skills already in use in the era of digital technology. Finally, these discussions and contributions obtained with the Focus Groups are presented in the conclusions recording the main aspects of attention and appreciation of the role of Pedagogy in the Digital Humanities because of the technological innovations and computational interaction that present themselves as new elements to incorporate the learning contents. 3.2. The place of Pedagogy in the Humanities

According to Hirsch (2012), pedagogy was seen as an afterthought and in parentheses in the context of research in Digital Humanities and that it would be necessary to take it further, taking it out of marginalization and exclusion to put it ahead, which in fact only happened after 2011/2012.

The author explains that the almost exclusion of pedagogy from the academic agenda was due to the great antagonism between teaching and research with a clear advantage and better chances for obtaining funds for research in the humanities due to the tremendous focus given to academic publications.

According to Giroux (1994), quoted in Hirsch (2012, p.6), the “importance of pedagogy does not fall simply on how students learn, but also on how educators (in the broad sense of the term) build ideological policies they talk about.” This aspect is a point whose discussion we consider fundamental for understanding the meaning of Pedagogy in the educational context of teaching and learning as we present it.

Saviani (2005) explains the relationship between education and its social conditions [emphasis added], understanding education as one of this practice's modalities. In other words, humanizing is integrating man into society in line with its conformations defined and accepted in the social contract. Freire (2003) shows that this offers man the political perspective to integrate with reality as well.

According to Hirsch (2012), thanks to this critical view on pedagogy, it was possible to evolve with specialization and technological development. By doing so, recovering, and incorporating the discoveries and stories that better clarify past issues and thus allow us to start telling them in other ways.

Because of this, Hirsch continues, curriculum development, the growing support of professional institutions and organizations in addition to funding agencies undoubtedly reshaped the landscape of pedagogy in the Digital Humanities (p.10). Hirsch (2012, p.13) also states that Pedagogy is the best way to stabilize a field of knowledge due to its canons representing the foundations of any discipline, that is, “what is taught,” in line with the aphorism coined by Roland Barthes. Canons have a fundamental role in reformatting the fields of study, and he considers it prudent to think critically about the institutional implications and political consequences when teaching Digital Humanities.

In the logic of networks (Castells, 2000), where several voices come together to seek, change and reconfigure information, improve our critical capacity, allowing us to build a learning culture that enables the construction of paths for the knowledge society. How can the teacher be a monitor and developer of the best practices in this direction, becoming the protagonist of this critical pedagogy?

3.3. Information, Knowledge, and Learning

Contemporary society has a decidedly new way of being and behaving as almost global similarities in many respects. According to Castells (2000, p. 25), “technology does not determine society, and neither does society write the course of technological transformation.” Still, everything results from very complex interactivity between creativity and entrepreneurial initiative, innovation, and applications by part of society and certainly, with the influences and consequences of network life.

In this model, more and more social behavior is transforming as the planetary society becomes immersed in network life (Castells, 2000), clearly affecting the learning process

through virtual contact and real-time knowledge of facts and information. McLuhan already noted about the social function of the media that “societies have always been influenced more by the nature of the media, through which men communicate, than by the content of communication” (McLuhan, 2007, p.22). As with the machine, it was not what transformed us but what was done with it and all its contents.

Likewise, the “content of writing is speech, just as the written word is the content of the press and the printed word is the content of the telegraph” (McLuhan, 2007, p. 22). The author clarifies that any medium or technology message is what they cause in human things, whatever their impacts. Thus, it is just a reflection on the countless effects that digital technology has been driving in the way of researching, learning, and building knowledge, opening new perspectives on reinterpretations of our trajectory as well as allowing us to advance across the borders where we park.

Technology accelerates an idea that has been highlighted since the 1990s, which already highlighted the “integration of different types of knowledge - practical and cognitive skills, factual and conceptual knowledge, motivation, values, attitudes, emotions, etc. - as an essential aspect of competency-based approaches ”(Coll, 1999, p.36).

In the context of this new educational complexity in which the adoption of ICT, the interdisciplinarity between pedagogical knowledge, the content of knowledge, and technological skills emerge as teaching motivations influencing new behaviors, yet another great challenge for contemporary education stands out: the competence of thinking and acting critically.

Society only changes if individual people are transformed. For that reason, educators need to see schools as social structures, making them work to “educate the potential that people have, to think, to act, to be individuals and to be able to understand the limits of their ideological commitments”(Giroux, 1999, p. 21).

According to Silva (2008), Information and Communication Sciences, as a social science that works with the info-communicational phenomenon, focus on behavior, the perceptible and knowable result of the essential competence of this science. According to the author, mastering computers and the Internet does not guarantee access, assimilation, and use of information with its own enrichment. Informational literacy goes beyond reading, writing, and speaking to the need for new cognitive skills to understand and effectively use computational tools.

The matrix of this understanding starts from the characterization given by Castells (2002) studied by (Coutinho and Lisboa, 2011) about the Information Society in which:

- Information is the raw material - There is a symbiotic relationship between technology and information. They are self-complementary;
- Power of influence and penetration of technological means in the social, economic, and political life of society;
- Network logic - the predominant characteristic of this new model of society, which facilitates the interaction between people extended to all types of processes and organizations, thanks to the recent information technologies;
- Flexibility - the power to reconfigure, change and reorganize information;
- Convergence of specific technologies to a highly integrated system - The continuous convergence process between the different technological fields results from their common logic of information production. All users can contribute (emphasis added) by playing an active role in producing this knowledge.

According to Coutinho and Lisboa (2011), these characteristics, of which we highlight convergence and integration, are linked to the new democracy of knowledge, to the sharing spaces that allow traffic without commercial and communication barriers. They also state that the “important thing in this society is not in the technology itself but in the possibilities of interactions they provide through digital culture” (Coutinho and Lisboa, 2011, p.8).

This understanding is made by integrating the characteristics described in this scenario, driven by the internet and digital technologies, defining for the authors the new social paradigm constituted by the Information Society. There is no time and then another. In-network life, ecosystems are interconnected, characteristics, present, and future possibilities are mixed and represent great challenges for planetary coexistence, especially for finding the most appropriate educational pedagogy for developing the Humanities.

The production of knowledge, the basis for the generation of wealth and economic resources of sustainability, depends, according to Hargreaves, on the ability to adapt to continuous changes and, at the same time, on the ability to learn autonomously and collectively. “The knowledge society is a learning society” (Hargreaves, 2003, p.37)

3.4. Informational Behavior and Integrated Cognition of New Competencies

Given the scenario designed so far, Education in the third millennium presents itself as

a great intellectual challenge for educators, educational managers and governments, politicians, philosophers, and contemporary thinkers. There is no defined line but a search for the governance of the process.

The surveys carried out by the OECD every two years have shown a ranking position among the countries, favouring applied pedagogy with technological use and comments that encourage successful experiences. The 2000 report already presented the view that “in the learning society, processing and managing information, as well as adapting to changes, represents success in improving the conditions of countries (OECD, 2000, apud Coutinho and Lisbon, 2011).

The authors also gathered some plural opinions, such as Fisher (2000), Fabela (2005), Veen and Jacobs (2005), and Veen and Vrakking (2009). They outlined a profile of challenges, assumptions, and competencies needed for Education today and in the future, as summarized below:

1. Lifelong learning is essential for building a new society. The information and knowledge society depends on this continuity of learning (Fisher, 2000);

2. A learning culture builds knowledge in a collective, continuous, horizontal way within a process in which all individuals individually and collectively have a voice acting in a self-training system (Fabela, 2005), with conditions such as:

- The challenge must mean the triggering motivation for students;
- The meaning must relate the relevance of learning to the previous knowledge that generates the yearnings and the needs of the search for this new knowledge;
- The relationship between learners and the lived world must be balanced with personal significance and any discomfort accommodated in the relational context;

3. According to the authors, they are general principles of education for the future based on the studies of Veen and Jacobs (2005) (Veen & Vrakking, 2009);

- Confidence in student learning. Prioritized and valued talents stimulate the learning process. Take the focus off finding the weak points;
- Relevance perceived by students, connection with previous knowledge - meaningful learning;

- Challenges that help the student to establish a relationship with the world in which he lives;

- Immersion instead of content step by step;

- Passion. The teacher needs to help awaken this feeling in students. Passion is the key to motivation;

- Self-regulation of teachers and students in co-responsibility for learning entrepreneurial spirit and creativity;

- Transformation of the curriculum;

- Respect and solidarity as essential values and principles of full and responsible citizenship.

These premises suggest conditioning elements connected with previous knowledge characterizing significant learning with significant observations to realize that technological application is not enough. Pedagogical competence works as an integrating vector.

In Silva (2008), there is also an important process arising from the digital technological evolution in which “the emerging post custodial, informational and scientific paradigm” of information and not just its simple documentary custody causes the procedural renewal of “origin, collection, organization, and storage, retrieval, transmission, and transformation of information “Silva (2008, p.27).

A new perspective is added to the more cognitively comprehensive informational behavior and focused on the user's search instruments and their assistance and scientific research, requiring constant improvements in processes and competencies. New ways of innovating, doing, researching, and teaching, pedagogically combine content skills of the object of study with technological skills, in addition to significant advances in pedagogical application in the Digital Humanities (Schulman 86, Freire 2003, Koehler & Mishra, 2007 and Hirsch 2012).

Table 3. Factors of the cognitive impact of changes in Informational Behaviour.

Leckie, Pettigrew, Sylvain (1996)	Wilson e Walsh (1996)
Places where information is sought	Knowledge of Information: direct or indirect knowledge of the sources, the process itself, and the information retrieved are factors of success of the search.
Characteristics of the professional and the information sought	Variables of success: reliability and usefulness of information, presentation, opportunity, cost, quality, and accessibility.
Types of sources such as colleagues, libraries, books, articles, and the experience itself. Different formats and access through formal or informal channels. Diversity of sources: internal, external, oral, written, personal, and collective.	Eight variables intervene in the information search process: personal, emotional: educational, demographic, social or interpersonal, environment, economic, related to sources (access, credibility, communication channels.
Existence of action patterns for definitions of informational behavior based on the model called sense-making, consisting of the following elements: (a) context of time and space in which the informational problem arises; (b) the difference between the contextual situation and the desired (uncertainty, gap or gap); (c) the result, which represents the consequence of the sense-making process (Dervin, 1983).	In facing the barriers that eventually arise in the use of sources in the search process, Wilson adopts the concept of self-efficacy from A. Bandura's cognitive, social theory, in which people organizing themselves from the perspective of the agency are proactive, self-regulating, and self-reflective with the ability to foresee and plan situations that are not simply products of the circumstances of life and with that, they can adopt personal standards and a monitoring scheme for themselves. (Bandura, 1977)

General note: Authors about factors that influence changes in informational behavior in the New Paradigm according to studies by Silveira and Oddone (2007). The table aims to illustrate the impact of new competencies by demonstrating the degree of complexity that the development of informational behavior has assumed with the changes in the new paradigm affected by digital technology.

The authors conclude that cognitive processes appear to be more influential in the perception of the need, choice, and decision for options of information sources to be sought than the availability of resources.

The perspective of human agency seen in Bandura presents two fundamental aspects for considering the possibility of autonomy and the creation of self-motivation in understanding the ways of developing cognitive skills and overcoming learning obstacles: the intentionality

in which “people form intentions that include action plans and strategies to carry them out”(p.15). Freire also reinforces the intentionality of the human conscience by saying that "it has an ever-greater dimension than the horizons that surround it" (Freire, 2005, p. 5). The second aspect is linked to the ability to anticipate situations of creating goals for themselves, and even predicting likely results (Bandura 2008). This concept is explored in forming the evaluative construct of teaching skills for the pedagogical use of technologies in teaching-learning in educational processes as follows.

3.5. The Context of Cognitive and Motivational Competencies

In the referenced academic literature, there is an immense variety of competencies necessary for contemporary life, already on the threshold of its third decade of the new millennium, which makes the task of overcoming the cultural backwardness present in the globe more complex compared to the speed of the innovative and use of digital technologies.

The scenario involving Teaching and Learning is increasingly complex, drawn by digital technologies with constant innovations causing communicational transformations in our contemporary life woven by overlapping reticular ecosystems, gradually leading us to a new way of inhabiting the biosphere.

The humanization process needs to be renewed as a matter of urgency and move away from educational delay statistics more quickly and effectively. It is not a matter of looking for a new pedagogical paradigm for the humanization process needed today and for the future. Paulo Freire, born before the digital revolution, reaffirms our understanding of the need for pedagogical realignment using technology in learning by saying that “teaching is not transferring knowledge but creating the possibilities for its own construction” (Freire, 2003, p .47). Thus, it anticipates the phenomenon of online learning currently underway, as well as aligning itself with the pedagogical use of technology in learning according to the constructivist theory, in which knowledge is the construction of the Human Being in time and a dialectical relationship with the object (Freitag, 1989).

In this complexity and context, the teacher assumes the critical role of mediator and promoter of acquiring and recovering knowledge, becoming the apprentice builder and active participant in the learning as a product of this interaction. (Piaget, 2003; Weisz, 2002). Network learning does not change this conception. What is seen is the possibility of a cyborg pedagogy

equipped with technological artifacts facilitating and participating as an actor (Latour) in the process.

The intelligent environment of the internet allows internet users to format and reformat some exploratory models and thus build knowledge through this journey through new cognitive, metacognitive, and epistemological experiences, therefore practicing and building new forms of learning (Chin-Chung Tsai, 2004).

However, it is evident that the new technological environment that is gradually changing our way of relating, working, and living in the biosphere requires a new set of knowledge, skills, and attitudes, thus modeling new competencies to be learned and incorporated into the practices of life.

The concepts of competencies expressed by John Dewey emerged during the Education Renewal Movement in the United States at the end of the 19th century, inverting the pedagogical action of the traditional school by placing greater emphasis on action. With this, in addition to leading students to find meaning in school content, he uses problem-solving methodologies to deal with change and the uncertainty of an unpredictable world (Dewey, 1959).

It is important for the understanding the transformative pedagogical content of this study, that the concept of competencies born in the century of knowledge emerges as an expression of autonomy inverting, in the world of work, the values preached by the Taylorist tradition (Zarifian, 2003). Autonomy has been contradicting the imperative need for rules, and “someone is both more qualified (and therefore paid) the more autonomous in their work” (p. 12).

The concept of competencies also came in the 1990s in response to the new standard of action in the globalized world in which the mobilization of resources, people, and new knowledge became necessary to account for the achievement of the social and economic objectives of growth, differentiation, and competitiveness with greater effectiveness (Prahalad, C.K. and Hamel, G.1990), to which the application of the concept of organizational competence is also attributed.

The key to understanding the practical value of the concept in the context of its emergence is the understanding of competence as knowing how to act seen as a behaviour that

goes beyond knowledge, as it refers to knowing and wanting to do, transforming knowledge into attitude and action made explicit in autonomous practice (Zarifian, P. 2003; Fleury, M.T. 2001). These authors develop a conceptual format showing the apparent differences between competence and knowledge. In Zarifian, 2003 we see that Competence is:

- Taking initiative with the individual taking responsibility for problems and events in professional situations that he faces, not limited to routine situations;
- Practical intelligence supported by knowledge and transformed in the face of situations as their diversity increases;
- Faculty to mobilize networks of actors, share challenges and assume areas of responsibility in the face of a set of situations;
- Result of explicit and evaluable practical action.

This author further specifies that the meaning given to “situations must be understood as a framework within a context, or even a field of responsibility in which:

- It is a spatio-temporal context that varies despite routines;
- Set of components of the situation defined here as references and potential resources for use by the subject of the action;
- A problem situation or set of problems that the subject of the action faces;
- The problematization is precisely the request of the initiative.

Thus, it concludes that initiative refers to the subject and responsibility refers more to the actor, and the taking of initiative is the “peak of the exercise of competence” (p.35).

We also found a definition that explicitly includes valuing the individual and adding value through developing and using competencies in the work universe. This is the concept worked on by researchers from FEA / USP, notably Maria Tereza L. Fleury and Joel Dutra, as it appears in Fleury 2000 and will serve as the basis for our following considerations.

The differential in this concept more focused on corporate dictates is precisely the implicit need for adding value. In other words, adding value is a differential in “knowing how to act” and, therefore, a prerequisite for action.

Fleury, in our view, gathers all the concepts studied and addressed as conditions for the recognition of competence; however, going further by making explicit the creation of value as a fundamental aspect for knowing how to act, as well as clearly exposing the challenge of overcoming the experience already transformed into a routine and the incorporation of creativity to seek the new and transformative actions. Thus, for the authors, the competence concept is *knowing how to act responsibly and recognizing that implies mobilizing, integrating, and transferring knowledge, resources, and skills, which add economic **value to the organization** and **social value** to the individual.*

Fleury's proposition is absolutely in line with reading the profile sought by contemporary organizations when they want people on their staff who correspond and fit exactly within this concept. Some of these characteristics are briefly described by Fleury through the action verbs shown below:

- Know how to act: know what and why you do it, know how to judge, choose, and decide;
- Know how to mobilize resources: create synergy and mobilize resources and skills;
- Knowing how to communicate: understanding, transmitting information and knowledge;
- Knowing how to learn: working knowledge and experience, reviewing mental models, knowing;
- Knowing how to engage and commit: knowing how to undertake taking risks and responsibilities;
- Have a strategic vision: understand the business and the environment and identify opportunities.

In this conceptual approach, we believe it is crucial to present the definition adopted by the MEC and expressed in the 1996 legislation when it was defined for the first time under the leadership of Cesar Coll³, bringing the experience of a similar study done in Spain to Brazil.

³Doctor of Psychology. Professor of Evolutionary Psychology and Education at the University of Barcelona. He has promoted and directed works and research on Pedagogical implications of genetic psychology and epistemology, psycho-pedagogical intervention guidance, design and development of the school

We want to value the choice and share with readers how important it would be to meet this profile in our educational system to add value to our society and individuals in isolation. According to MEC (1996), someone has professional competence when they:

- Constitute, articulate and mobilize values, knowledge, skills, and attitudes to solve problems that are not only routine but also unusual in their professional field;
- Act effectively in the face of the unexpected and the unusual, overcoming the accumulated experience transformed into a habit and freeing the professional for creativity and transforming performance.

As a conceptual example, we also reproduce the cognitive axes worked by MEC at ENEM represented by the five competencies chosen as the basis of the evaluation process:

1. **Mastering languages:** mastering the cultured norm of the Portuguese language and making use of mathematical, artistic, and scientific languages;
2. **Understanding phenomena:** building and applying concepts from the various areas of knowledge to understand natural phenomena, historical-geographical processes, technological production, and artistic manifestations;
3. **Facing problem situations:** selecting, organizing, relating, interpreting data and information represented in different ways to make decisions and face problem situations;
4. **Build argumentation:** relate information represented in different ways and knowledge available in concrete situations to build consistent argumentation;
5. **Elaborate proposals:** use the knowledge developed in the school to elaborate recommendations for solidarity intervention, in reality, respecting human values and considering socio-cultural diversity.

This conception of the Competencies model is currently in the process of being revised and updated by the MEC, including it in the Common National Curricular Base, defined as “the mobilization of knowledge (concepts and procedures), skills (practical, cognitive and

curriculum and Analysis of school educational practices.

socioemotional), attitudes and values to solve complex demands of everyday life, the full exercise of citizenship and the world of work.” In defining these competencies, BNCC - *Common National Curriculum Base* recognizes that “education must affirm values and encourage actions that contribute to the transformation of society, making it more human, socially just and also focused on the preservation of nature” (BRASIL, 2013), also showing itself in line with the 2030 Agenda of the United Nations (UN) The implementation is delayed, according to an official note from the MEC itself due to the problems of the Pandemic.

The concept covers a set of ten general skills to be developed throughout the period of Basic Education as follows:

1. Valuing and using the knowledge historically built in the physical, social, cultural, and digital world to understand and explain reality, continue to learn, and collaborate to build a fair, democratic, and inclusive society;
2. Exercise intellectual curiosity and resort to the sciences' own approach, including research, reflection, critical analysis, imagination, and creativity, to investigate causes, elaborate and test hypotheses, formulate, and solve problems and create solutions (including technological ones)) based on the knowledge of the different areas;
3. To value and enjoy the diverse artistic and cultural manifestations, from local to worldwide, and to participate in diverse practices of artistic-cultural production;
4. Use different languages - verbal (oral or visual-motor, like Libras [*Brazilian Sign Language*], and written), body, visual, sound, and digital - as well as knowledge of artistic, mathematical, and scientific languages to express and share information, experiences, ideas, and feelings in different contexts and produce meanings that lead to mutual understanding;
5. Understand, use, and create digital information and communication technologies in a critical, meaningful, reflective, and ethical way in the various social practices (including school ones) to communicate, access, and disseminate information, produce knowledge, solve problems and exercise protagonism and authorship in personal and collective life;
6. Valuing the diversity of knowledge and cultural experiences and appropriating knowledge and experiences that enable you to understand the relationships of the world of work and make choices aligned to the exercise of citizenship and your life project, with freedom, autonomy, awareness, criticism, and responsibility;

7. Argue based on facts, data, and reliable information to formulate, negotiate, and defend common ideas, points of view, and decisions that respect and promote human rights, socio-environmental awareness, and responsible consumption at the local, regional, and global level, with ethical positioning concerning the care of oneself, others and the planet;

8. Know yourself, appreciate yourself, take care of your physical and emotional health, understand yourself in human diversity, recognize your emotions and those of others with self-criticism and the ability to deal with them;

9. Exercise empathy, dialogue, conflict resolution, and cooperation, ensuring respect and promoting respect for others and human rights, acceptance, and appreciation of the diversity of individuals and social groups, their knowledge, identities, cultures, and potential, without prejudice of any kind;

10. Acting personally and collectively with autonomy, responsibility, flexibility, resilience, and determination, making decisions based on ethical, democratic, inclusive, sustainable, and solidary principles.

It is not the scope of this thesis to evaluate and/or comment on the work still in progress. Still, it is possible to recognize its incredible complexity and challenge in finding the best methodological and instructional practices for teachers' pedagogical preparation to implement these skills.

Consider, for example, the complexity contained in the definition of what is expected as technological competence, the subject of this thesis, and, therefore, totally in agreement with the need to have it implemented. The need is immense, but the challenges, too, certainly require pedagogical vision, significant investments in infrastructure, and monitoring for the implementation and development of teaching, mainly composed of digital immigrants. Certainly, a multi-annual project, but it needs to be started urgently.

3.6. How the Cognitive and Motivational Competencies Model can Help

As a question or reflective proposal, we should also note that it is not at all challenging to compare the competencies conceptually defined here and the quality work always required of teachers in all categories of our education system. The challenges are immense. The level of

success achieved is certainly not satisfactory for teachers' or society's wishes, making questions and frustration always present in the teaching context.

The motivational element for self-efficacy appears in the research given the well-known and unchanged environment of wear and tear involving teaching life, due to the natural demands and comparative and heavy difficulties against the lack of attention to the career and its motivational components in almost all senses, notably for basic public education.

Collective intelligence relating social ties to knowledge and connective intelligence materializing this relationship in the dimensions of the mind, the world, and the network in which we live today, according to Levy (2007) and Kerchove (2014), define the determining technological environment for a new skills profile. This perception needs to be assimilated and developed quickly under the risk of a cultural chasm caused by the speed of technological innovation compared with the delay of organized and effectively implemented educational actions.

Based on the pedagogical ideas raised in this study, an alternative is proposed for the integrated adoption of cognitive and motivational skills to use technology in educational processes effectively, initially focused on the teaching role as a mediating element of the formal humanization process.

This alternative is based on the reconceptualization of the model of integrated knowledge of technology, pedagogy, and disciplinary contents - TPACK, technological pedagogical content knowledge by Khoeller & Mishra (2007), updating it to the concept of integrated cognitive competencies plus the motivational and self-component Bandura's teaching effectiveness (1977), changes that certainly strengthen the previous construction, as justified in the methodological scenario in section 1.5

The so-called DCCM - Domain of Cognitive and Motivational Competencies is a construct that represents the design of an alternative idea on the way to understand and apply in a pedagogically conceived way as the most effective in teaching and learning processes, taking into account the teaching role in any circumstances are more or less comfortable for teaching practice.

Figure 8 illustrates this idea and was tested in front of two focus groups made up of specialists and consultants in Education. They are very active in the Brazilian context and, above all, experienced concerning the content under evaluation in how it advocates the effective application of the Focus Group technique.

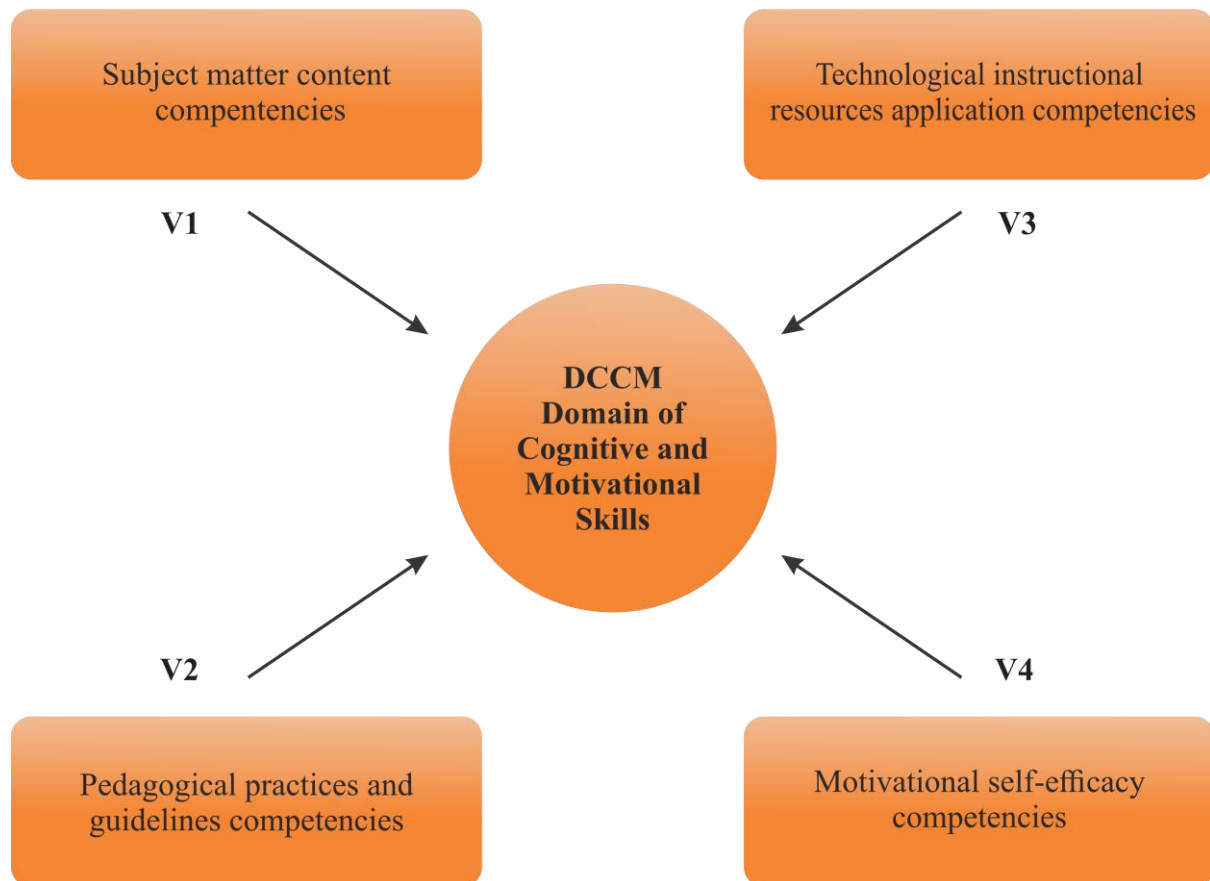


Figure 9: DCCM - Domain of Cognitive and Motivational Competencies

Note: Authors based on TPACK adapted with competencies concept and Bandura's self-efficacy concept

In this work, the focus was still the protagonism of the teacher as a mediator in a model to bring his guiding role even closer to the students also under the influence of the new times of digital culture.

The study resulted in the methodological conception of a conclusive design on the cause-and-effect relationships verified between Cognitive and Motivational Competencies

responsible for the domain attributed to the best teaching performance expected in teaching and learning activities using technology in a pedagogically effective way.

The DSR technique - Design Science Research (*covered in the methodological section, 1.5.1. p.17*) because of its great applicability and success in Information Systems for decision shows conceptual similarities of great support to the relevance in the present research, considering that the final decision produced will depend on the performances and motivations of people subjected to a certain organizational and institutional model making decisions and making choices of ideas democratically and autonomously.

It is important for the understanding of the transformative pedagogical content of this study that the concept of competencies born in the century of knowledge appears as an expression of autonomy inverting, in the world of work, the values preached by the Taylorist tradition (Zarifian, 2003; Coll, 2007).

The key to understanding the practical value of the concept in the context of its emergence is the understanding of competence as knowing how to act seen as a behavior that goes beyond knowledge, as it refers to knowing and wanting to do, transforming knowledge into attitude and action spelled out in autonomous practice (Zarifian, 2003; Fleury, 2001).

The study resulted in the methodological conception of a conclusive design on the cause-and-effect relationships verified between Cognitive and Motivational Competencies responsible for the domain attributed to the best teaching performance expected in teaching and learning skills with the use of technology in a pedagogically effective way, in figure 8 represented by V1, V2, V3, and V4.

The human agency perspective seen in Bandura (2008, p.15) presents two fundamental aspects for considering the possibility of autonomy and the creation of self-motivation in understanding the ways of developing cognitive skills and overcoming learning obstacles: the intentionality in which "People form intentions that include action plans and strategies to carry them out." The second aspect is linked to the ability to anticipate situations, create goals for themselves, and predict likely results, a fundamental concept in the construct for characterizing the affective relationship of wanting to add to knowledge and competence.

The DSR - Design Science Research qualitative technique was used to explain, discuss, and validate the DCCM, given its great applicability and success in Information Systems for

decision verified in Hevner et al. (2004), as explained in the section on methodologies applied (page). In a broad methodological study focused on the application of the DSR in the scope of research questions in this area, conceptual similarities of great support to the applicability in the present research are verified, considering that the final decision produced will depend on the performance and motivations of people submitted to a certain model. Organizational and institutional making decisions and making choices of ideas democratically and autonomously as in IS projects.

The proposed Domain is only valid with the strength of these measurement indicators, the four competencies that form the domain, reflecting it is keeping a correlation between themselves. It is pointed out as a causal factor to explain and confirm this hypothesis.

The discussion and validation of DCCM took place by applying the qualitative technique of 2 Focus Groups totaling 19 specialists working in teaching, research, and educational management. The option of the Focal Groups technique, as well as the choice of 19 specialists aimed at criticality and professionalism in the interpretation of teaching conditions for teaching and learning within a new and challenging context in terms of technological use in differentiated content activities, having to include in their baggage the mastery of these new skills.

In this study, the technique was used with the same logic through specialist professors discussing issues sensitive to their own day-to-day work and new observations on content for incorporation into the article.

3.6.1. Evaluation Process

The work with the two focus groups was organized in stages described as follows:

Step 1: Previous preparation of the participants by reading a document containing objectives, form, and criteria for discussion, as well as a summary of the approaches of the theoretical framework related to the competencies included in the DCCM construct presented in figure 1.

Step 2: Discussion in the focus groups of the four open guiding questions related to variables V1, V2, V3, and V4 of the DCCM construct to assess their degree of adherence and significance in the formation of the proposed model:

V 1: Competencies related to disciplinary content

The guiding question discussed: *What is the understanding of the importance and meaning of the competencies related to the disciplinary contents for the teaching function as an integral part of the Domain of cognitive and motivational competencies?*

Contributions of the focus groups: The Teacher must adequately know the contents of his discipline, keep constantly updated to be able to deal with the curricular grid established in the subject, guide research of new information and doubts of his students, as well as know-how to establish relations with practices related to other subjects in the curriculum. Deep and updated knowledge of the discipline in its context is a key factor for teaching.

V2: Application competencies of technological resources

The guiding question discussed: Based on your current practices and experiences, what is the impact of technology on the teaching function, and what suggestions can be applied for its adoption?

Contributions from focus groups: The benefits are unquestionable, especially when teachers perceive the effects on their work. However, ICTs are constantly changing, and it is not easy to keep up with them, especially for older generations. Technological skills must be part of the teachers' training curriculum associated with pedagogical learning and incorporated into everyday practice. They must be supported by specialists inside the school units until the assimilation of instructional and technological skills reaches a level of proficiency in the school's digital culture.

The learning of technological applications in an integrated manner must be supported by a tremendous initial effort by the Ministry of Education and Culture (MEC) by offering instructional resources with technological applications at a distance, covering all curricular contents in a planned way, and making use of all good initiatives established in the external market already available, as well as in the laboratories or innovation centers developed inside the schools.

V3: Competencies of Pedagogical practices and guidelines

The guiding question discussed: *How are knowledge and pedagogical practice assessed in the classroom, and what is their importance in integrating with the technological application?*

Contributions of the focus groups: In fact, there is a view that what matters is knowing and mastering the contents of the discipline taught. Most of the time, practices are disintegrated even within the curriculum itself. However, the best ways to represent ideas are not sought, with better analogies, experiences, and formulations of the object as it should be, however, due to the lack of the necessary competence that needs to be better developed. Many teachers only transport the social use of ICT into the classroom, and most recognize that students have a greater command of them. The evaluators reinforce the premise that pedagogical knowledge refers to the particular way of transmitting the contents and concretely teaching competence. New information technologies offer a wide variety of possibilities for representations. However, they require tuning in with the correct pedagogical application, and this needs to be well developed as it requires skills beyond knowledge. It is not enough to take the ICTs of social life to school without this proper harmony

V4: Motivational self-efficacy competencies

The guiding question discussed: *How to balance motivation for teaching during so many difficulties and even more with technology as another challenging factor?*

Contributions of the focus groups: Everyone recognizes that teaching work is, in fact, a composite of different life stories of people who, in addition to the disciplinary contents, need self-control to know and help the student, a great object of their missions. They believe in self-efficacy as this human capacity for motivation and overcoming obstacles and highlight the need for greater social recognition because of the environment and challenges that the teacher faces. This motivation is also a result of the personal conditions of the teacher, the student, the family, and the school, being able to contribute to and facilitate the achievement of the desired goals or not.

Step 3: Although the evaluation, according to the scope of the article, focused on qualitative technique with Focus Groups, in the third stage of the meeting, it was decided to assign a score (from 1 to 4), from lowest to highest, for indicators V1, V2, V3, and V4 of the DCCM construct - Domain of cognitive and motivational skills, expressed in figure 1, as a way of confirming the contributory strength in explaining and justifying the measurement variables on the assessed domain.

The result of this exercise showed that the groups agreed that each measurement variable, or formative indicator, would then be considered a domain of competence receiving a definitive wording in the formation of the Construct called Domain of Integrated and Motivational Cognitive Competences, illustrated in table 4:

Table 4: Formative indicators of the DCCM construct

Latent variable	Indicator	Indicators definition
H1-DCCM	V1	The content domain is essential for integrated learning and choice of teaching resources.
	V2	The conceptual and practical domain of the pedagogical function in learning.
	V3	The domain of instructional and computational technological resources with pedagogical meaning.
	V4	Competencies related to the self and the context of people as agencies and motivated by self-efficacy and ethical values.

Note: Indicators based on Adapted TAPACK

In addition to being strongly agreed by the evaluators in the discussions of the two focus groups, the quantitative exercise confirmed the causal and formative relationship of the domains Vi, V2, V3, and V4 in the composition of the DCCM Construct, considering that the average of the variables is higher than grade 3, the maximum is equal to 4. Thus, considering that the sample standard deviation around the mean is less than 1 for all variables, the amplitude (difference between the upper limit and the lower limit of the confidence interval for the sample mean) of the 95% confidence interval is less than 1. Besides, the load factor is greater than 0.7, which is 0.88 on average, demonstrating the great importance given by experts to these indicators in building the construct.

Table 5 below illustrates the balance and strength of the measurement indicators to approve the adopted conceptual strength as an illustration of these statistical statements.

Table 5: H1 / DCCM - Domain of Integrated and Motivational Cognitive Competencies

Variable	Statistic		
	Average	Std Deviation	Load
DCCM	3,75	0,4136	0,9375
V1	3,85	0,3664	0,9625
V2	3,75	0,4443	0,9375
V3	3,05	0,7592	0,7625
V4	3,45	0,7592	0,8625

Note: Loads importance obtained from qualitative Focal Group evaluation.

3.6.2 Final focus group discussions and contribution

Participants expressed their final comments and contributions for incorporation into the conclusions following the summary and highlights below:

1. Pedagogical knowledge, recognized by the evaluators as a particular form of knowledge of the content directed explicitly to the competence of teaching, has great potential for updating and developing models and instructional resources to configure a pedagogy in line with the new ways of learning and which do not limit yourself to face-to-face spaces in the classroom, or excessive reliance on the guidance of teachers and books, without being dependent on ICT alone.
2. Technology is recognized as necessary in the composition of new pedagogy to support teaching and learning in the contemporary context and beyond our time. However, despite the benefits, its assimilation comes as another major challenge in teaching cartography, considering its variety of applicability, speed of innovation, and different degrees of effectiveness due to the appropriate use and the quality of the infrastructure available.

3. Education as a transformative action does not transfer knowledge. Still, it must deal with teaching mediation with the world outside the school, seeking technological integration and assimilation, and developing an innovative spirit in an environment of open, democratic, and responsible participation by all those involved. This thought definitively guided the view of the evaluative groups on the teaching activity in its context of a transformative critical pedagogy as a protagonist value of the educational process.

3.7 Conclusions

The methodological process itself has already constituted learning about building these ideas through the force of competence sharing.

In the development of discussions, the evaluators observed that to propose a pedagogy is, in fact, to offer a political vision and that in this perspective, when it comes to teaching practices, it is necessary to talk about politics in its social meaning involving the lives of teachers in its surroundings, besides meeting the educational aspirations democratically targeted by society as a whole.

There was a clear understanding of technological adoption in the teaching and learning processes in a pedagogically effective way, reinforcing the need for mastery and constant development of this competence. Given this, the observance of the “canons” advocated by Schulman (1986) becomes very relevant, enumerating a series of considerations that surround the meaning of the pedagogical domain, namely [our translation]:

- The teacher's Knowledge perspective. Domains and categories of content knowledge and their relationship with: (a) knowledge of the subject's content concerning the subject, (b) knowledge of the pedagogical content, and (c) curricular knowledge.

- The perspective of Knowledge of pedagogical content: a particular form of knowledge of content specifically directed to the competence of teaching, including the most usual ways of representing ideas, the most powerful analogies, illustrations, examples, explanations, demonstrations, in short, paths of representation and formulations of the object that make it understandable to students.

- The Curricular Knowledge perspective. The teacher is expected to be familiar with the curricular materials studied simultaneously by his students in other subjects, relating the themes and discussions.

In fact, as Coutinho and Lisbon observe, the teacher needs a reconstruction of his identity, notably the digital immigrants who, due to the technologies, need to be prepared for this new environment, "being able to re-signify learning and autonomously stimulate collective production and organized through digital networks "(2011, p.15)

Incorporating A. Bandura's concept of teacher motivation and self-efficacy contributes by adding value to the research model and giving more voice to the subjective element evaluated when considering the teacher in his surroundings.

This basis for studying the role of teachers in the teaching and learning process with the adoption and assimilation of technology in educational processes was also studied in the context of large-scale processes such as the case of the Brazilian Education System as a whole. In sequential work, an alternative structural model was developed aiming at incorporating technology into the Brazilian educational process, in which the analysis of institutional aspects, technological infrastructure, and expected behaviors of facilitating technological incorporation by teachers and managers is taken in an effective and planned manner, as a reference to the reality experienced in Brazil.

Also, there are still spaces for realignments, understandings, and discussions on international protocols and standards, not to stop but to recover the ethical responsibility that belongs to the creator of the algorithms and not to the executing actors.

This Focus Group, therefore, broadened the ethical discussion placing greater vehemence and optimism on the need to increase the humanization process with the teaching appropriation of cognitive competencies for moral development and, above all, paradoxically, as stated by Puig and Garcia (2010), acting strengthened with the "The very condition of citizenship and personal motivation inherent to the teaching mission due to the simple fact that they are people and citizens. There are no specialists or special knowledge. " (p. 9), but the mediation of the school, allowing human reflection on all available knowledge.

Therefore, in the subsequent discussion on this construct, the ethical value will be expressed together with self-efficacy and motivation in the ICC construct.

Chapter 4: A new Knowing how to act educationally for a new inhabit⁴

The conception that education takes the central position in our social life is still immature, considering its condition as a humanization process of the individual facing the collectives.

The discussion on the complexity of the contemporary educational process (Morin, 2007) in its traditional form still needs reflection for developing ideas and strategies for proper ICT application in harmony with the pedagogical, technological, and content competencies model. This is due to the digital communicative revolution already accepted globally as provoking significant effects on our social life. It is, therefore, necessary that the education process is in line with the speed of digital changes. The delay is profound, and the need for social investments to overcome this great problem is enormous, but certainly, a radically new path for education is necessary.

4.1. Introduction

New competencies applied to a new way of living in the future leads us to exercise in this session the application of a model of technology adoption that considers the educational complexity inserted in a large-scale environment with the challenges inherent to the Brazilian educational system. The example is rich in diversity, demographic challenges, cultural and regional differences, and political and institutional complexity

Castells (2001) suggests that one way to delve deeply into technology's impacts on educational processes is to begin by understanding the complexity of education. As an example, we may posit the new organizational complexity added to higher education, that is, employability challenges due to commercialization in the competitive global market; this begs the question of whether it positions itself as a business reality or as a societal aspiration (Sanfor et al., 2015; Pucciarelli and Kaplan, 2016).

⁴ Texts, structural model, evaluation, and conclusions extracted from the article "Evaluating ICC - Integrated Cognitive Competencies for enhancing Teacher's adoption of technology in a large education environment," published in Heliyon., As an extension of the teacher profile, according to the mention presented in an article previously.

Along these lines, Yukawa (2015) recommends preparing for the complexity and the problems arising from the world's adversities by employing learning transformation approaches. On the other hand, Kegan and Lahey (2016) point to an organizational project that aims at deliberately developing through a culture in which everybody is supporting personal learning, focusing on identifying negative personal profile traits and devising strategies for overcoming them.

There are variations of the same fundamentals of complex thinking that Yeyinmen's (2016) approaches in research on how high-performance leaders' practices exceed limits by prioritizing nonobvious connections to develop engagements that promote broader, more sustainable relationships.

The various examples covered are based on learning new competencies for profiling the actions necessary for interconnected life. As Morin points out, much is gained from this perspective; many of humankind's most significant discoveries could not have been accomplished without the revelation of a simplicity hidden behind the apparent multiplicity and disturbance of phenomena. However, the whole and the parts, order, and disorder, and the observer and the observed are parts of the same process. Complex thinking addresses the reality and, therefore, must be able to understand and act in a multidisciplinary manner (Morin, 2007).

Libâneo (2005) posits that knowledge networks are characterized by the exchange, multiplicity, and complexity of relationships and shared meanings. In contemporary life, knowledge, which is networked daily, is linked to social practices. Libâneo also says that, consequently, knowledge arises from a network of relationships in which people share meanings. However, Bruner (2002) points out that during learning processes, science and common sense combine by virtue of the contradiction between scholarly and daily knowledge, the coexistence of which facilitates the formation of the real social subject, as opposed to the one that schools idealize.

Therefore, we should be concerned about how connective technology has changed how we learn since the Internet and its informational and relational smartphone applications became virtually ubiquitous. Relevant research on two Australian universities aimed at evaluating the use of technology in higher education suggests that digital technologies are not 'transforming' the nature of university teaching and learning (Henderson et al., 2017); the authors conclude that use and practice are not the most expressive and exciting that digital technologies could

offer and that universities need to continue developing their digital resource repositories, improving reliability and know-how in terms of what to do and how to act concerning improvement. In addition, the example taken in this study forces us to recognize the difficulties and concerns about the infrastructure and technological readiness challenges, as well as the quality of leadership necessary for the true sustainability of the proposed model.

This fact calls for urgent pedagogical reflection. The notion of ‘school’ needs to be reconfigured. In addition to the challenges of assimilating innovative technology (a problem also faced in other application areas), pedagogical aspects must be combined with learning content if educational processes are to benefit from proper assimilation (Khoeler and Mishra, 2007; Mouza et al., 2017).

New educational complexities due to the world's digital transformation raise a conceptual idea that underscores critical pedagogy concepts (Giroux, 1994), which the global scholarly community should revise. To put this in question form: Is it not time for educators and policymakers to rethink education beyond schooling? (Collins and Halverson, 2018).

Although Paulo Freire did not experience the digital age, there are convergences between his ideas and our understanding of pedagogical interest in using technology in learning processes. By stating that “Teaching is not transferring knowledge but creating possibilities for its own construction” (Freire, 1996, p. 22), Freire anticipated the current phenomenon of online learning, converging with the idea of prospecting a new means of providing democratic education, based on the concept of education for citizenship. Thus, there is a pedagogical basis for the pertinence of using technology in learning processes, according to a constructivist theory, in which knowledge is the construction of the human being in time and a dialectical relationship with the object (Freitag, 1989).

Given this complexity and context, the student is a builder and an active participant in the learning process. At the same time, the teacher strives to be a mediator and a promoter of the acquisition and recovery of knowledge, thus creating the process but not the product (Weisz, 2002). According to Davis and Sumara (2014, p. 4), this idea remains up to date because complex thinking interrelating several theories “is a new attitude toward studying particular sorts of phenomena that is able to acknowledge the insights of other traditions without trapping itself in absolutes or universals.” The Internet as an intelligent learning environment allows its users to form and reformulate some exploratory models, building

knowledge through these new step-by-step, cognitive, metacognitive, and epistemological experiences and practicing and constructing new forms of learning (Tsai, Chin-Chung, 2004; Colchester et al., 2017). This context provides great opportunities for teachers to be well-prepared, thus facilitating their assumption of the important mediator role.

It is evident, however, that the new technological environment gradually changes our social relationships, workplaces, and, eventually, our own way of learning in the face of media and technological news. According to Colchester et al. (2017), in this development field, adaptive teaching platforms are being thought of as a response to individual and metacognitive differences in learning.

There has been a significant advancement in terms of the complexity of education with respect to some ideas that were designed for smart cities, such as the creative school, which offers individual developmental schedules in place of a standard curriculum; Gomedé et al. (2018), posit that self-learning through the promotion of self-study, via several initiatives, provide students of all ages with a menu of courses covering all areas of knowledge; and a virtual world that is populated by virtual teachers who reach students via applications, allow the classroom to break the boundaries of the physical school.

Given the technological speed of innovation, we need to learn how to deal with barriers to change. According to Fullan (1993, p.8), “change is ubiquitous and relentless, forcing itself on us at every turn.” The authors also say that the secret to development and growth is eliminating negative forces and taking advantage of positive ones.

In research on barriers that affect the adoption of technology, Ertmer et al. (1999) have already highlighted first and second-order barriers since 1999, that is, both the material, instrumental and technological as well as the cultural ones linked to the pedagogical beliefs of teachers and their own origins and training outside the technological world.

It is not only a matter of attracting massive investments in technology; a promising future also requires a better understanding of how superior performance is combined with societies' willingness to adopt economic, social, and technical changes. This connection is proposed by critical pedagogy, according to which education must reflect a society's aspirations and political needs (Giroux, 1994). Questions like “Where does ICT fit in pedagogical processes?” and “How does ICT affect students' cognitive abilities?” are still open for research

(Flogie et al., 2018). Even applications that produce an adequate level of learning retention through artificial mentoring systems in the intelligent learning environment face difficulties adapting not only to learners' knowledge but also to their emotional states and the context in which learning takes place (Herder et al., 2017).

The need for change has become more urgent since the 1990s in response to the world's new globalized action patterns, in which the mobilization of resources, people, and novel knowledge has become necessary to more efficiently achieve social and economic growth, differentiation, and competitiveness goals (Prahalad and Hamel, 1990).

It is vital to understand that because this behavior refers to the knowledge associated with the will to do things, it goes beyond transforming knowledge into attitude and explicit action in practice (Zarifian, 2001; Fleury & Fleury, 2001).

According to Levy (2007) and Kerchove (2014), the technological environment for a new competence profile is defined by the collective intelligence that links social ties to knowledge and materializes this relationship in the dimensions of the mind as well as in the network and the world in which we live today. This perception needs to be rapidly assimilated and developed in peril of a cultural abyss caused by how technological innovation seems to be happening at a rate that is lightyears ahead of organized, effectively-implemented educational actions.

This new educational complexity must also deal with the transformational advent of digital technology, constant innovations, and new media influencing novel behaviors and challenging the credibility of ethical values. At this point, we appreciate Finland's exemplary attitude, as the country has put educational guidance on fake news in place for children, as evidenced in 'Education —How Finland is fighting fake news in the classroom' (Charlton, 2019).

Another concern about ethical values for the future comes from UNESCO guidelines for their smart cities project, which involves the assignment of educational responsibility for non-compliant conduct from the outset. Despite the lack of a consensus on a universal definition of a smart city, even in educational principles (Allam and Newman, 2018), it is easy to understand that the inhabitants of such cities will need technological competencies to live in an environment that is interconnected through the Internet of things (Mikusz et al., 2015).

This new profile will delineate a multidisciplinary way of dealing with complexity in line with Morin (1992), as well as understanding the impacts of technology with Castells (2001).

As Collins and Ting write (2014, p. 5), “That is what makes education a unique profession. Teachers are immersed all day in the lives of their students, continually getting to know them, keeping up with changes in their lives at school and at home”; hence, teachers significantly affect students’ lives. The competence to think and act critically and ethically to orient students to the future is another unique challenge that contemporary education faces, and which should therefore be included in the model, the research plan, the hypotheses, and the constructs to be evaluated, which will be presented next

Finally, Table 6 reviews a reflective synthesis of the key elements in changing contemporary life affecting the teaching and learning processes and understanding the scope of adopting a new social action profile through the integrated cognitive competencies proposed in this study.

Table 6. Key elements reinforcing the need to change the contemporary pedagogy of life

Challenged changing factors	Impacts on teaching and learning
Contemporary conflicts and uncertainties.	They are part of the epistemological complexity to be understood and assimilated: (Morin, 1992, 2001, 2007, 2009).
Teaching and learning as part of the same process in interconnected life.	New social practices with communicative technology in real-time. New cognitive and integrated competencies for a new planetary coexistence in constant changes (Morin, 1992).
Cultural delay and overcoming gaps with technology and innovations to be assimilated and managed, including fake information and disruptive moral behavior.	Critical pedagogy defining how society wants to learn and teach (Freire, 2003; Giroux, 1994); overcoming barriers (Tondeur et al., 2017; Flogie et al., 2018; Fullan, 1993).
Self-efficacy, motivation, and ethical vision to human beings.	(Bandura et al., 2008; Morin, 2001).
Teachers taking a leading role in guiding and mentoring the educational process: “Teaching is not transferring knowledge but creating possibilities for its own construction” (Freire, Freitag, 1996, p. 22).	Teachers and students assuming the construction of their own learning in the school and the networks enabled by collective intelligence (Levy, 2007; Kerchove, 2014; Freitag, 1989; Weiz, 2002; Tsai, Chin-Chung, 2004; Colchester et al., 2017).

The educational process constantly renewed and fed with innovative technological resources: Creative school, individual developmental schedules, self-learning, and several other initiatives breaking the boundaries of the physical school.	It is time to understand what pedagogy means. The notion of school needs to be reconfigured. Pedagogical aspects must be combined with learning contents and technological applications (Khoeler and Mishra, 2007; Mouza et al., 2017; Gomedede et al., 2018, Colchester et al., 2017).
This section presents an alternative proposal for application in a large-scale educational system, which no longer has time to consider long-term progress. The challenge is to implement a model that results in a new social action profile centered on integrated cognitive competencies, combining knowledge with the assimilation of the desire to build and transform reality with actions driven by self-efficacy and <i>antropoethical sense for the benefit of collectives</i>. (Morin 1999).	

Notes: The authors show the impacts on teaching and learning caused by contemporary conflicts and uncertainties, suggesting our self-reflection.

The Coronavirus (COVID-19) pandemic raised awareness of the extreme need to set up a new way of living, learning, and teaching with the necessary efficiency and speed, thus recovering our cultural backwardness. Critical pedagogy points to a new political awareness and global social responsibility. We have already assumed the fear of death and economic losses. Now we must definitively assume the collective conscience for change and innovation leading our Destiny.

4.2. Research Plan, Hypotheses, and constructs for evaluation (H1, H2, H3)

4.2.1. Research plan

Following Dresch et al. (2015), the DSR methodology is used to reach a solution for a specific, real-life problem by arriving at a “solution that can be generalized, so that other researchers in different situations may also make use of the produced knowledge” (p. 68). In addition, these authors and Hevner et al. (2004) highlight the value of DSR prerequisites, namely rigor and relevance in the application, from the point of view of the professionals who intend they should utilize the research, as well as the credibility and reliability of the contribution with respect to a given area's existing knowledge (p. 68), according to the phases presented in Figure 10.

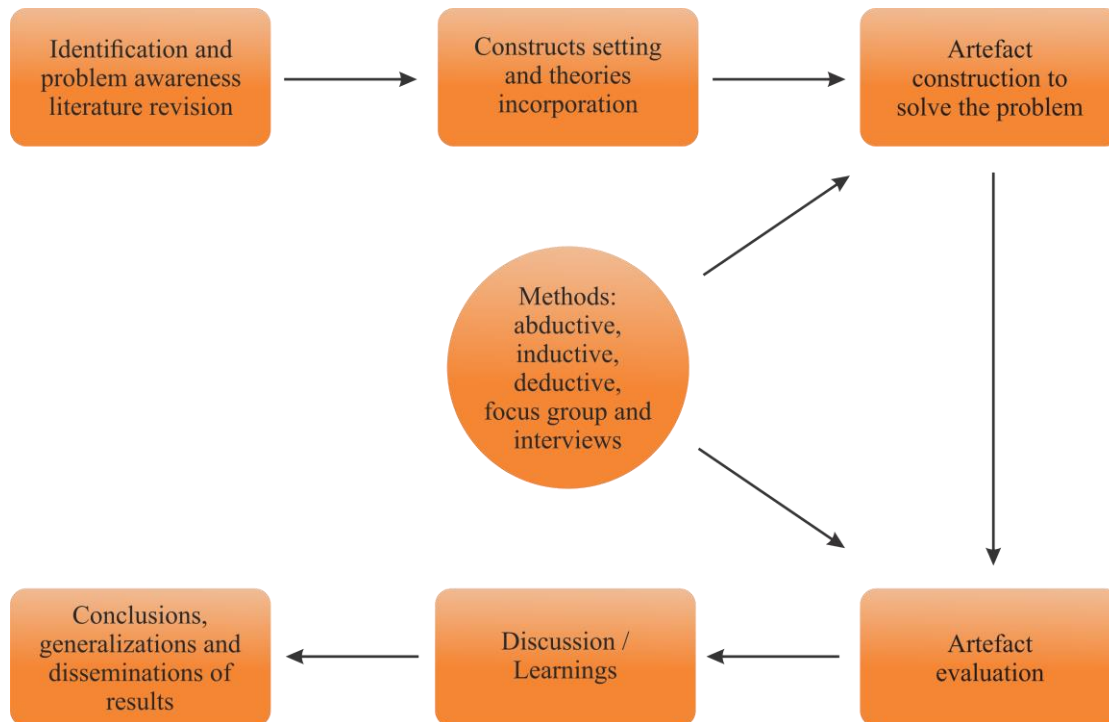


Figure 10. DSR Stages and Methodology. Note: adapted from Dresch et al. (2015).

4.2.2 Research Hypotheses

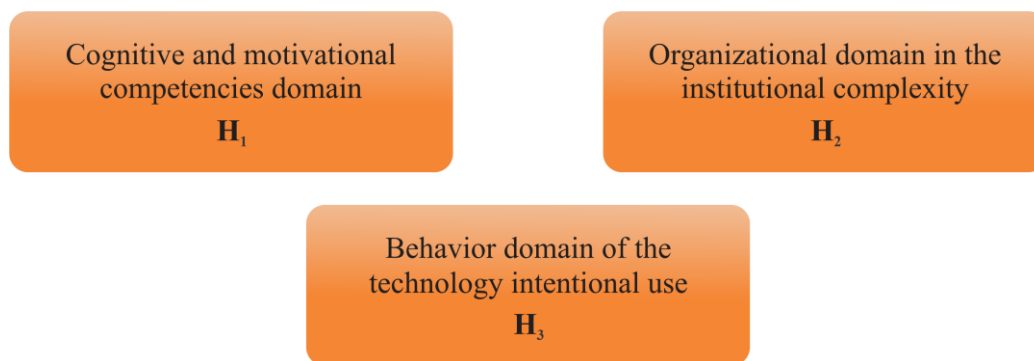


Figure 11. Domains identifying the evaluated project's hypotheses: H1, H2, and H3. Authors.

This study aimed to demonstrate that the efficient adoption of technology in educational processes is the result of a conjunction of factors involving the three sets of contextual conditions gathered in the constructs H1, H2, and H3. They are also called domains and can be

understood as a series of causes and effects involving people, technology, and organizations, all of which are interrelated and converge for the intended purpose, as shown in Figure 10.

The primary conditions in this study are described below in H1, H2, and H3. The hypotheses were put forward based on three theoretical models that have already proven effective for the adoption of technology; we adjusted those models or combined them with other models. The theories that support H1, H2, and H3 are classics of academic literature in technological, organizational, and institutional adoption and have been applied in the most diverse set of organizations and situations.

In the case of this research, the Brazilian educational system served as the reference environment because it shares characteristics with a large multinational organization in terms of its organizational and institutional complexity. The necessary adaptations were made in elaborating content for the measurement indicators while keeping the theoretical structure intact. In H1, Khoeler and Mishra's (2007) pedagogical content knowledge (TPACK) was made more appropriate through our adaptations, as will be shown in the development.

Following the project design, measurement indicators were developed based on the literature review, and some were adapted during the focus group discussions.

The knowledge teachers acquire and act on is driven by their desire to achieve self-efficacy (the motivational context), which is produced by their own conditions and the personal exercise of self-control. However, this paper raises the following questions for discussion:

- Which integrated cognitive competencies can help increase the effectiveness of technological application in broader educational contexts?
- Do teachers know how to cope with pressure from their near surrounding, such as institutional and organizational conditions?
- How could the combination of H1 and H2 facilitate the acceptance and implementation of technology in educational pedagogical projects?

4.2.3. H1: cognitive and motivational competencies (CMC)

CMC direct teachers and anyone else involved in educational processes to mobilize the competencies of integrated application (and not merely the knowledge) of course content,

associating it with pedagogical concepts and canons, and also with ICT, in line with the educational project at hand.

The H1 measurement indicators come from the TPACK theory, that is, technological pedagogical content knowledge (H1a, H1b, and H1c), supplemented by a new indicator based on Bandura's theory on motivational/self-efficacy (H1d), as shown in Figure 3.

Our first construct, H1, refers to the domain of people who are focused on education with the new 'knowing how to act' outlook and are endowed with ICC, comprising the causal relationships in TPACK theory, which was originally developed by Koehler and Mishra (2007) and inspired by Lee Shulman (1986), who sees the structure of pedagogical knowledge as the essence of effective learning practices.

In their academically well-established framework, Koehler and Mishra propose that knowledge should be the focus of school subject elements (pedagogical, technological, and content).

The CMC construct (H1) reconfigures the central position that knowledge occupies in the TPACK theory. Based on two contemporary reference parameters, knowledge is repositioned as the competence of responsibly applying 'know how to act,' which involves mobilizing, integrating, and transferring knowledge, innovation, resources, and skills. It also adds value to an environment undergoing fast-paced transformation without necessarily leading to higher levels of competitiveness, as seen in large-scale corporate environments (Fleury & Fleury, 2001; Prahalad and Hamel, 1990; Zarifian, 2001).

The ICC relate simultaneously to a school subject's field of study, to pedagogy, and to technology itself, as they are "derived from the intellectual capacity followed by knowing how to deal with concepts and theories, knowing how to generalize, to apply terminologies and classifications, to relate and integrate content" (Resende, 2003, p. 59).

This adaptation to TPACK reconfigured the conceptual centrality to the competence dimension, "knowing how to act," rather than content knowledge, pedagogical knowledge, and technological knowledge expressed in the original model. The meaning is to express the great importance of "knowing how to act" in a complete sense rather than knowledge in its restricted understanding.

The traditional school still moves from a unilateral directive perspective. The teacher says, and the student listens, notes, memorizes, and repeats and the teacher's concern is focused on the teacher's knowledge of the subject being taught.

The ICC reinforces the pedagogical concepts seen from the perspective of L. Schulman (1986), as well as the modern concepts of Siemens (2005), organizer of the theory of learning in the digital age, as shown in Mota (2009), in the following lists in that we gather the essentials and classify them as domains:

Mastery of teaching skills

- It is directly linked to the "knowing how to act" of teachers
- Pedagogical principles linked to school projects and curricula
- Three categories suggested by Schulman: (a) knowledge of the content of the subject taught, (b) knowledge of the pedagogical content; and (c) curriculum knowledge
- Knowledge of pedagogical content is specifically directed towards teaching competency. This includes the most common ways of representing ideas, the most powerful analogies, illustrations, examples, explanations, demonstrations, representation paths, and object formulations that make it understandable to students.
- The teacher must have a real arsenal of alternatives; some derived from research and others from practical experience
- Research and experiences provide space for updating and modeling and instructional resources to establish a pedagogy aligned with new ways of learning

Pedagogical competence is linked to the proper use of pedagogical principles, in line with school projects and curricula and supported by Paulo Freire's critical thinking. He evokes that "teaching requires research" and that "there is no teaching without research and research without teaching." Continuing, Freire (1996, p. 29) also says.

These acts are in each other's bodies. While teaching, I keep looking, failing. I teach because I research, I asked, because I ask myself, and I ask myself. I try to verify, verify intervention, intervene, educate, and educate myself. I try to know what I don't know yet and communicate or announce the news.

In the domain of technological competencies in CCI, the connectivity of Siemens (2005) is the essential factor in teachers' "knowing how to act" because:

- The principles of networks define the knowledge and the learning process
- Knowledge is defined as a particular pattern of relationships and learning, such as creating new connections and patterns on the one hand and the ability to maneuver through existing networks and patterns on the other.
- Connectivism deals with the principles of multilevel learning: biological/neural, conceptual, and social/external
- Connectivism focuses on including technology as part of our distribution and knowledge of cognition. Our knowledge is in the connections we create, whether with other people or with information sources such as databases
- While other theories pay partial attention to context, connectivism recognizes the fluid nature of context-based knowledge and connections
- Understanding, coherence, interpretation (sense-making), and meaning (meaning) as prominent elements in constructivism are elevated to a critical level of importance in connectivism due to the rapid flow and abundance of information.

As a significant parameter and conceptual basis, we have introduced the concepts of cause and effect into the construct with respect to teachers' self-efficacy behavior in the context of Albert Bandura and his collaborators' social cognitive theory. Thus, the ICC are incremented using behavioral analysis that helps teachers overcome obstacles and ferments the desire to develop eager-to-learn attitudes regarding technological instructional resources and their adoption in support of their teaching activities.

Teaching work is, in fact, composed of different life stories and anxieties of people who, in addition to mastering disciplinary content, need self-control and empathy to know and help the student, the main object of their mission. Teaching is a challenging practice that requires applying knowledge and skills in different situations and contexts, requiring constant search and transforming the teacher's attitude. (Becker, 1999).

Look at the teacher's environment with the challenged competencies requesting attention on their behavior and attitudes all day long while leading students and referencing them.

It seems a perfect expected profile, sometimes challenging to understand and very hard to implement. See figure 12.

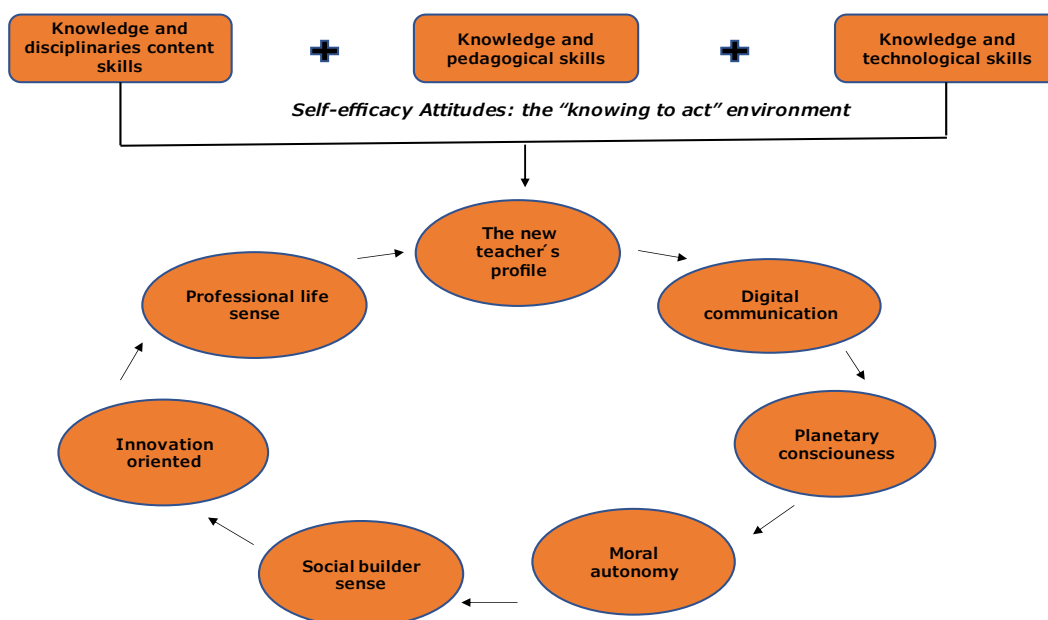


Figure 12. Expected behaviors and teacher's self-efficacy attitudes in ICC.

Notes: authors reinforce how great the difficulties of applying teacher's competencies needed.

Paulo Freire, outside the context of the digital age, said that educating is giving meaning to every moment of our lives, which becomes a challenge for our contemporaries. "Nobody walks without learning to walk, without learning to walk the path. Just as at another time, he says that "nobody educates anyone, nobody educates himself; men educate one another, mediated by the world. " (Freire 2011, p. 95-101). In this profile, the teacher reads and interprets the world and remains a mediator in the students' relationship with life's advances and innovations.

The author adds that in this causal chain, people and planners, and predictors are also self-regulators, adopting personal standards to monitor their functioning. Thus, driven by the integrity of their thoughts and actions, they make the necessary adjustments and project the operations of the personal agency on the broad social network.

As a result of this dynamic of influences, "social cognitive theory rejects the dualism between personal agency and a social structure disconnected from human activity" (Bandura, Azzi, Polidoro, 2008, page 16).

The CMC approach also considers Bandura's (2008) reflections on how these challenges involve cultivating and adopting research attitudes that are eager to produce knowledge based on experience and teaching practices, thus contributing to the accumulation of new educational knowledge. This process involves perception, thinking about information, learning, and regulating self-efficacy in the epistemological creation of each teacher's own practice and improved, organizing, and executing courses of action that are aimed at a performance.

Cognitive social theory supports this pedagogical proposal because in its definition of agency, "People are self-organized, proactive, self-regulating, and self-reflective, contributing to the circumstances of their lives, and they are not just products of these conditions" (Bandura et al., 2008, p. 15).

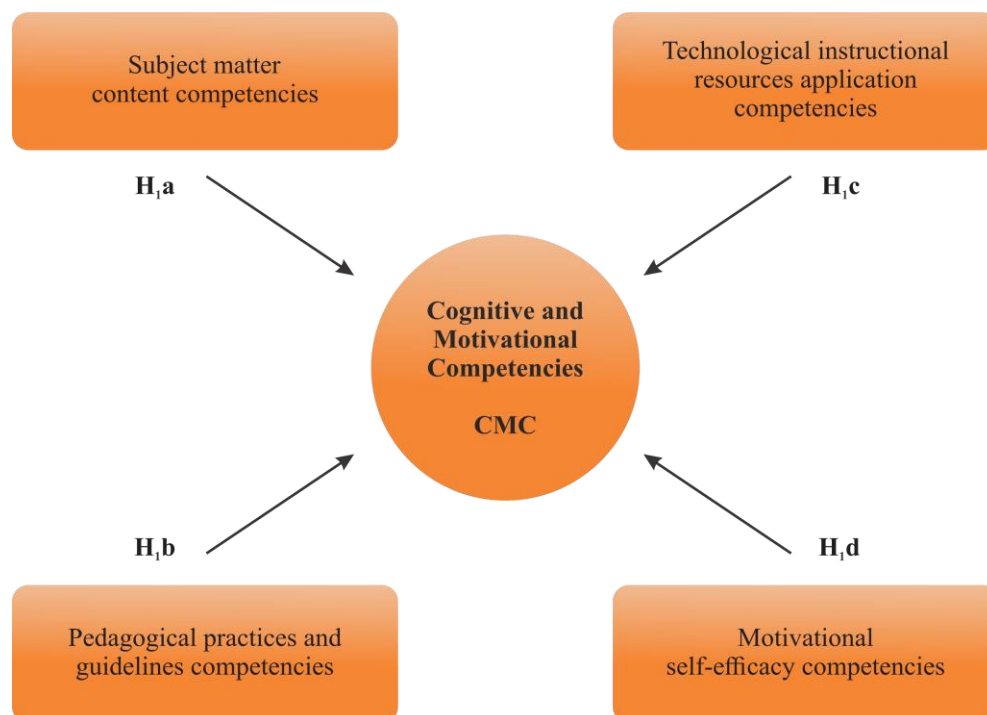


Figure 13. See CMC the most valuable construct in the ICC framework.

Note: This is the same construct adapted from TPACK currently being evaluated as part of the ICC – integrated cognitive competencies.

4.2.4. H2: *organizational and institutional complexity (OIC)*

Teaching activities generate more expressive results under favorable conditions in the context of institutional and organizational complexity. To consolidate awareness and the tools for a holistic design in approaching the research problem, we analyzed the literature for successful applications of technology adoption/acceptance models. With some room for adaptation, we also looked for complementary models to help complete the composition of our ICC constructs.

Thus, our model combines two theoretical references that are well established in the academic literature for adopting technology in various sectors and business organizations but with measurement indicators that are entirely focused on the reality of the Brazilian educational systems' organizational and institutional conditions.

The technology, organization environment (TOE) framework that Tornatzky and Fleischer developed in 1990 consists of three contexts that influence the adoption of innovation in a company's internal or external environments. Combined with institutional theory (IT) (Christensen and Scott, 1995; Scott, 2001), TOE was used in this study as a conceptual reference, bearing in mind that the large environment being studied (the Brazilian educational system) presents significant, peculiar factors pertaining to how structural and organizational actions are conceived.

According to Christensen and Scott (1995), decisions are not guided purely by rational efficiency goals but also by the social and cultural factors that lead to processes that are required to have the same form in other sectors where the same conditions exist. Institutional environments constitute significant factors that affect organizational structure; therefore, actions that are in keeping with them are required.

For example, Scott (2015) posits that higher education in today's context includes a more diverse range of organizational forms, depending on certain specific objectives.

Hawley (1968) in DiMaggio and Powell (2000) argues that isomorphic processes are constraining processes that force one unit in a population to resemble other units that face the same set of environmental conditions; such processes are important features of the considerably

large Brazilian education system, which spreads across the country's five regions. They can have the same effect in the educational environment.

The Brazilian educational system (which was taken as a case study) is governed by a national constitutional contract; therefore, the educational environment is expected to become isomorphic due to federative entities' interdependencies and exchanges, both among themselves and between each entity and the federal government (Meyer & Rowan, 1977).

In this scenario, the educational system is subject to political and demographic influences, a pressing need to make up for delays, and national plans governed by the country's constitution, which, unfortunately, have not been adequately fulfilled due to ineffective and not-quite-uniform management. In line with these system goals, the measurement indicators incorporate elements related to institutional isomorphism as predictors of success in adopting ICT in Brazilian education.

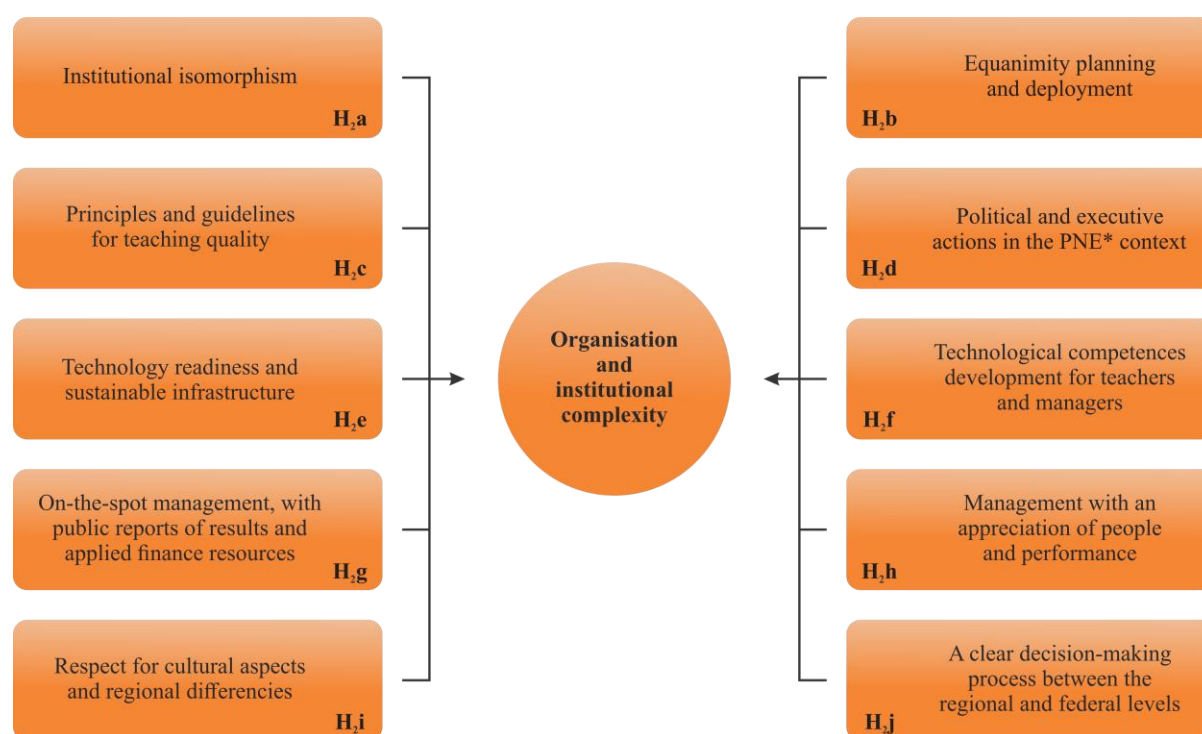


Figure 14. Organization in the context of Institutional Complexity and measurement indicators. Notes: *PNE – Nacional Education Plan: constitutional instrument validated by the Brazilian National Congress for a 10-year compliance extension. The measurement indicators' contents were aligned with Brazilian environment-specific situations.

In terms of institutional complexity, the organizational domain is the construct that gathers the measurement indicators that define the actions necessary to execute and achieve results in the organizational and institutional context of the Brazilian educational system. These indicators, which the focus groups evaluated, underwent some content or wording changes during the process of reaching a consensus within the group. For example, in H2c, the indicator initially described as Teaching quality rules became ‘Principles and guidelines’ in the post-discussion version (see Figure 11).

4.2.5. H3: behavioral intentional use of technology (BIUT)

The teaching environment, which incorporates social relationships, family, co-workers, students, etc., influences or reinforces the adoption of intentional behaviors regarding the use of technology and related instructional support in educational processes. Under favorable conditions, the work environment may generate performance expectations and effort expectancy.

This domain employs adaptations of UTAUT – Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003), and UTAUT 2, one of the best-known adoption models, as well as TAM – Technology Acceptance Model (Davis, 1985) and TPB – Theory of Planned Behaviour (Ajzen, 2011).

There are countless reports of successful UTAUT application experiences regarding evaluating acceptance behaviors and the use of innovations such as mobile banking, comparisons between different countries’ acceptance processes, third-generation mobile telephony, wireless network technologies, mobile banking systems, and notably, mobile commerce, primarily due to advantages such as ubiquity and immediacy (Anderson and Schwager, 2004; Carlsson et al., 2006; Dwivedi et al., 2019; In et al., 2011; Min et al., 2008; Palau-Saumell et al., 2019; Williams et al., 2015). This theory is regarded as important work and integrates eight major theories. It considers performance expectancy, effort expectancy, social influence, and facilitating conditions as measurement indicators that exert significant impacts on users.

An extension of this theory, UTAUT 2 by Venkatesh et al. (2012), includes measurement indicators like hedonic motivations, price, and habit, explaining 74% of the variance of intention of behavior and 52% of behavior of use; it is considered effective for

consumption situations (Herrero Crespo et al., 2017; Faria et al., 2014; Ramírez-Correa et al., 2019).

Teachers feel they are doing collaborative work when they share their difficulties as well as what they have learned. This attitude motivates them to take pleasure in overcoming obstacles together, with the overarching goal of helping students perform better.

Hedonic motivation (present in UTAUT 2) is, therefore, a function of the positive results obtained collectively, combining Satisfaction with improved teaching performance and confidence in facilitating the best quality of teaching, as shown in Figure 14.

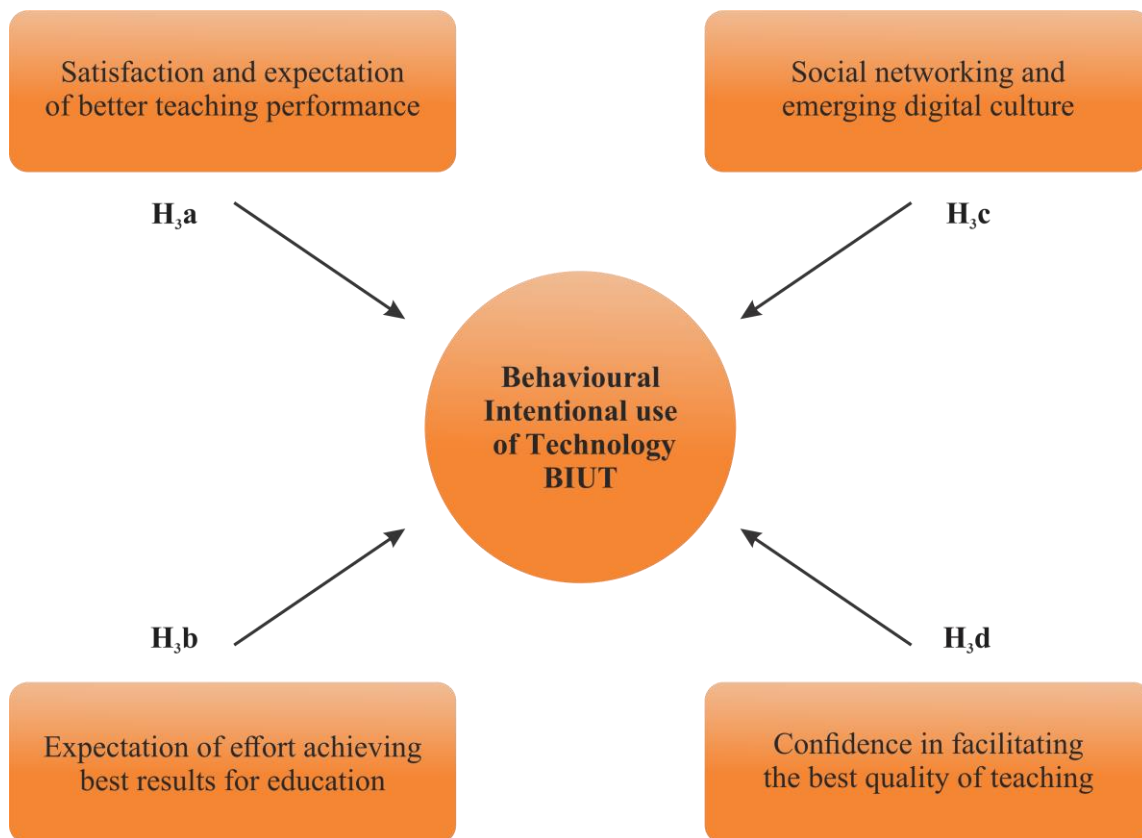


Figure 15. Behavioral Intentional Use of Technology and measurement indicators according to Venkatesh et al. (2003)

Table 7 shows the constructs H1:CMC, H2: OIC, and H3: BIUT with the respective adapted conceptual theories followed by the authors. We should reinforce that CMC is a substantive adaptation of the TPACK, which will be presented in future work.

Table 7. Constructs, adaptations, and theoretical sources

Construct	Adapted conceptual variables	Authors
H1 CMC	Technological pedagogical content knowledge TPACK Technological pedagogical content competencies Motivational self-efficacy competencies	Koehler and Mishra (2007) Wiziack and Santos (2019) Bandura (1977)
H2 OIC	Institutional theory; H2a, H2b, H2c Technology – organization – environment, H2d, H2e, H2f, H2g, H2h, H2i, H2j	DiMaggio and Powell (2000) Tornatzky and Fleischer (1990)
H3 BIUT	Unified theory of Acceptance and use of technology; H3a, H3b, H3c, H3d	Venkatesh et al. (2003)

4.3. Method: building the framework to solve the problem

Our framework integrates people, organizations, and technology. It employs CMC to address the contemporary reality of how teaching should be transformed by digital culture. The CMC in our proposed framework consider the teacher's role to be the most strategically positioned for enhancing the application of technology in large-scale educational contexts.

The first step was to reconfigure the TPACK-inspired vision (Khoeler and Mishra, 2007) by changing knowledge to competencies and including self-efficacy as a perspective and as a motivator for teachers' actions, as seen in Bandura (1977).

The next stage was integrating the CMC construct in our proposed framework, together with OIC and BIUT. The causal relations among the three dimensions studied will constitute the determinant success factor with respect to the framework's adoption.

Finally, the measurement indicators that we have applied to evaluate each construct in order to better predict teaching behavior in a broader context, under the influence of the national education system's organizational and institutional forces, also came from the referenced National Education System, as well as the IT, TOE, and UTAUT theories, as shown in Table 2 (See Figure 6). With these adaptations, we considered DSR –Design Science Research in the methodological scenario going through the following phases:



Figure 16. Research stages

4.3.1. Methodological scenario and goals

DSR was adopted due to its applicability in decision information systems, in accordance with the guidelines proposed in the studies and through the observations of several reputable authors who were involved in the development of DSR and in the formulation of its key concepts and practices (Baskerville et al., 2009; Hevner et al., 2004; Peffers et al., 2007; Van Aken and Berends, 2018).

In this sense, our main concern in the present study is a method for artificially addressing the matter (Simon, 1996) to lead to a design that can solve a worrying, known problem in educational management.

Although DSR is relatively recent in terms of practice, with open, developing criteria and forms of evaluation, several authors, e.g., Koehler and Mishra (2007), Wiziack and Santos (2019), Bandura (1977), DiMaggio and Powell (2000), Tornatzky and Fleischer (1990) Venkatesh et al. (2003) consider it an established method in the literature (Prat et al., 2014). These authors argue that in terms of information systems research, DSR aims to assist with creating models, which are also called artefacts, to solve practical issues. Although it has only recently been put to use and the applicability criteria are fragmented and incomplete, the authors have contributed by offering an inductive study of 26 articles published in the last five years.

In their 2014 study, they present a holistic view of DSR evaluation criteria and generic methods drawing from general systems theory and thus considering its object as an organized whole in which the parts are related, generating emerging properties and having certain objectives.

Hevner et al. (2004) conducted an extensive methodological study focused on the application of DSR to information systems research issues; they have verified the existence of

conceptual similarities that provide ample support for the applicability of our research. In the comparative summary presented in Table 3, it is clear that the organizational and behavioral paradigms do involve the studied process's environment (the educational system) and, most importantly, that the results depend on the performance and motivation of people who are subjected to an organizational model as well as on an institutional structure that is subjected to a management system.

Design science focuses on the creation of artificial systems and solving issues through the construction and evaluation of artefacts that represent the needs and solutions that have been identified with regard to the studied business and real-life problems (Barab and Squire, 2004; Hevner et al., 2004; Van den Akker et al., 2006). According to Barab and Squire (2004), it is important to understand that “Cognition is not a thing located within the individual thinker but is a process that is distributed across the knower, the environment in which knowing occurs, and the activity in which the learner participates” (p. 2).

In view of justifying the set of methodological activities employed in this study, certain parameters served as guiding principles for the step-by-step development of a subsequent planning process built upon the central hypotheses evaluated in the ICC model. Those parameters are:

- The school's social and institutional challenges in view of teachers' reinterpretation and preparation through curricular renewal.
- Holistic, systematic problem-solving, considering the following dimensions: objective, environment, structure, activity, and evolution.
- The re-establishment of convergent concepts for the application of a cyborg pedagogy (Haraway, 2013)⁵ that best fits today's education as well as the future, considering the educational cycles and their respective specificities for the coexistence of human and non-human resources in a state of constant knowledge update.

⁵ Haraway (1991), see in Garoian and Gaudelius (2001), defines the cyborg as “a hybrid of machine and organism, a creature of social reality as well as a creature of fiction” (p.149). In this line of thought, we only defend, not the metaphor, but the real practice that the contemporary and future humans should teach and learn mediated by a reconfigured innovative pedagogy that incorporates the technology devices in education.

- The need to act in a transdisciplinary, democratic, and participatory way, ensuring the visibility of all designed dimensions (people, organizations, and technology) so that the knowledge obtained by applying the proposed model can be of practical use in the educational system.

An awareness of the relevant problems and their conceptual specificities has led us to propose a strategic path, which was discussed and validated by education specialists in focus groups. The resultant conclusions and contributions allowed us to postulate a possible means of properly adopting technology in learning processes in broader educational systems in a manner that is both planned and institutionalized, with the potential for efficacy, as endorsed by our model.

4.3.2. ICC –the Design Science framework

Finally, we arrived at the framework itself, which consists of three sets of contextual conditions gathered in the constructs H1, H2, and H3. Those domains are rooted in cause-and-effect situations involving interrelated people, organizations, and technology that converge to serve the intended purpose.

The central construct, H1–ICC, combines four indicators intrinsically linked to people, especially teachers, who play a key role by constituting the meaning and reason for the existence of H1, the measurement variables of which are mutually dependent. On the other hand, H2 is comprised of institutional and organizational conditions, using correlated indicators, though not maintaining a rigid interdependence relationship between them. With its five associated indicators, the latent variable H3 represents the best condition for acceptance and engagement in the project of adopting technology in education

. The relationships that the three constructs have created and projected amongst themselves are, by abduction and induction, considered part of an information system for the configuration of the intended project.

At this stage of methodological application, it is crucial to reinforce the understanding that the framework under evaluation is an alternative project that offers a solution to a real-life problem. However, there are always other variables to consider.

Figure 16 depicts the set of measurement variables, supported by theoretical references and practical observations, that were presented as propositions to the two focal groups; the specialists commented on them and hence contributed to a final solution to the problem.

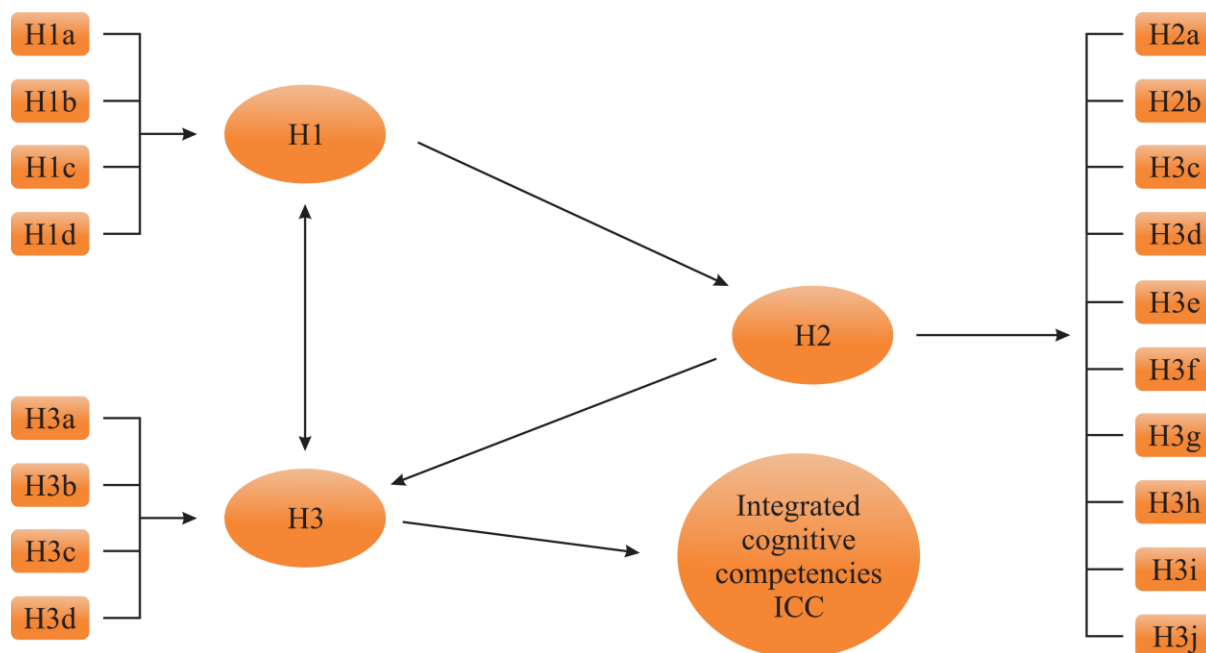


Figure 17. The ICC framework assessed as an alternative project for educational systems.

Note: authors according to table 7 details.

4.3.3. Structural framework – the ICC assessment process

This section aims to demonstrate the criteria applied in this study and present a comprehensive report showing how the work was rigorously and empirically validated by employing two focus groups and three individual interviews with a total of 28 qualitative evaluation participants.

The project involves designing an alternative means of implementing an effective educational management system understood as a set of cause-and-effect relationships between people, organizations, and technology. All three elements are interrelated, converging in some way towards the success of the planned adoption of a model for incorporating technology into the Brazilian educational system. The evaluators discussed and approved this, and it also finds support in scholarly references and research through the process described next.

4.3.4. The focal group technique

Using two focus groups, the members of which were education specialists with diverse experiences, allowed for higher critical quality in the design stage. The measurement variables extracted from the theoretical frameworks were used to support the study and raised awareness of possible difficulties. Based on the experiences gathered, we diversified the actions to be discussed.

Focus groups originated in the field of clinical psychology as a tool to help researchers understand how emotions, associations, and motivations influence human behavior. Later contributions led to the use of focus groups in marketing research to gauge consumers' perceptions of prices, products, and brands, as well as their reactions to advertisements.

The marketing community's adoption of the focus group technique has already supported many projects, prevented commercial disasters, and improved results by better understanding consumers' attitudes (Langford and McDonagh, 2003). *See in methodological section, Focus Group technique, p. 18,19.*

4.3.5. The process

The three domains (H1, H2, and H3) consist of variables that are not directly observed (latent) but which can be evaluated by their indicators, using the evaluators' perceptions and knowledge (Vilares and Coelho, 2011).

Thus, regarding the H1 construct (cognitive and motivational competencies), the evaluators agreed with the explanatory power of the indicators (measurement variables) H1a, H1b, H1c, and H1d to form the H1 hypothesis. Therefore, if these indicators explain H1, they are correct by abduction. This finding was also validated for the other variables, H2 and H3, and their respective indicators or measurement variables.

The framework evaluation (H1, H2, H3) followed the same process. The focus group participants evaluated each latent variable (H1, H2, and H3) with regard to its level of contribution to the desired result; they also suggested corrections to the statements used in the measurement indicators when necessary. The qualitative evaluation process, conducted via focus groups and interviews with specialists, was performed in four sequential steps, as described in the next section.

4.3.6. Model evaluation stages

As *preliminary preparation*, the evaluators received a questionnaire one week before the focus group meetings. The questionnaire featured statements about the variables and their indicators, and it was intended that the participants should read, respond, and engage in prior reflection. They were asked to evaluate their level of agreement on a 4-point Likert scale: I disagree, I partially agree, I agree, I strongly agree.

During the *first round* of the evaluation meeting, the participants discussed questions classified as “partially agree” or “disagree.” None of the issues to be addressed were excluded, and there were no suggested wording changes or content corrections. The collected observations were considered in formulating the measurement indicators of our model's hypotheses, as will be detailed in Section 5.

In the *second round*, after the conceptual discussions, the evaluators initially assigned a score ranging from 1 to 4 (lowest to highest) to each construct's measurement indicators to evaluate the respective contribution forces in the latent domain or the explained variable. It was a complementary way to express each measurement indicator's weight in relation to each latent variable's quantitative importance.

The focus groups evaluated the contributory force of each construct (H1, H2, and H3) regarding the formation of the desired structural model in the *third round*. They applied the same quantitative approach in the final framework with the weight value of each latent variable.

In the *last round*, the participants made final contributions to the conclusion. Finally, two specialists from a private school in the areas of computer laboratory and robotics and the public Municipal Directorate of Elementary Education of the city of Valinhos –SP participated in in-depth interviews in which the entire research process was reviewed and commented on. It was also an opportunity for clarifications and where we could receive suggestions of pedagogical aspects to be considered involving technological applications, difficulties, and family engagement. They also discussed teachers' lack of competencies and the development of plans to adopt technological tools.

5. Assessment: results and discussion

H1 –CMC was elected to carry the highest weight in the final framework, bearing in mind the crucial roles that self-efficacy and teacher motivation play in this complex mission.

Moreover, competencies in the use of technological tools associated with the correct pedagogical application to teaching represent the heart of Koehler and Mishra's well-established TPACK theory, which has repeatedly been proven reliable through steadily positive academic outcomes in several countries throughout its 17 years of existence. It should be noted that in the over 100 publications on TPACK perused during this study, we found no construct-specific adaptations, as we propose in this paper.

ICC consider the concept of competence instead of knowledge and incorporate motivation and self-efficacy into the construct. Koehler et al. (2013, p.14) recognized and stated this and recommended new paths as follows: teachers operate in diverse contexts of teaching and learning, and teaching with technology is a complex, ill-structured task. We propose that understanding approaches to successful technology integration requires educators to develop new ways of comprehending and accommodating this complexity.

The authors also state in this text that applying the framework has to be thought of as the best way for the teacher to teach the intended content. For example, a practical application of TPACK was a conceptualization for the learning environment platform called 'MyCloud.' The authors report that the model integrated pedagogy and content taught through mobile-cloud integration, showing good usability as perceived by students (Wong et al., 2014).

This domain in our research is valid only through the strength of its four measurement indicators, which maintain correlations between them and point, as a causal factor, to an explanation and confirmation of H1. For this competence to be valid, predictive indicators should be explicit and thus establish a causal relationship for forming an integrated cognitive competence. In addition to meeting the evaluators' strong acceptance, all measurement indicators are important concepts in the academic literature, supported mainly by Koehler and Mishra (2007), Shulman (1986), and Bandura (2008), as shown in Table 8.

Table 8. Cognitive and motivational competencies and indicator

Latent variable	CMC	Indicators definition
H1	H1a	Content knowledge is essential for integrated learning and the choice of pedagogical resources.
	H1b	Conceptual and practical mastery of the pedagogical Component of learning.
	H1c	Mastery of instructional and computational technological resources with a pedagogical meaning.
	H1d	Competencies related to the self as an agent motivated by self-Efficacy, motivation, and ethical value.

Note: Authors. Measurement indicators inspired by TPACK competencies added by Bandura concept and Morin's ethical value.

In the H2 –OIC construct, isomorphism dictates that common core factors of Brazilian culture must be prioritized, such as discipline concerning implementation and the assurance of equanimous resources for all public education units in the country, in line with a plan and responsibilities that are assigned and guaranteed in its execution. The evaluators concluded that the sentiment and attitude of loyalty and commitment to a project of this magnitude would be driven by balanced, effective management, with fair appreciation and treatment of people regarding their results and performance (H2h). In sum, people appreciative management is a critical success factor (Glover et al., 2014).

It should be noted that the indicator H2j (clear decision-making process shared between the regional and federal levels) complements this very close causal relationship between communication, trust, and commitment, all of which are valued by the participants of the focus groups and by those individually interviewed with a great deal of reflection on the subject of intentional behaviors of acceptance and use of technology.

With regard to the organizational aspect, the evaluation groups acknowledged the extreme difficulty in executing such a complex project. However, they asserted that the measurement indicators being evaluated, as well as the strength of the H2 construct in the structural model's composition, are adequate and fundamental for the feasibility of a project with such challenging objectives. The evaluators adjusted and agreed on these indicators in their new definition (as well as in H2a, H2b, H2h, and H2j), which is italicized in Table 5.

However, legitimacy is a critical institutional concept, essential for the operational validation of the variables defined in H2 as a perspective on and a guarantee of the process (Suddaby et al., 2017). According to Suchman (1995, p. 574), “legitimacy... [is] a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially-constructed system of norms, values, beliefs, and definition”. The Brazilian educational system and other large, complex organizations need legitimate institutional sustainability in daily life to leverage the future.

Recent research shows a significant and direct relationship between technological, organizational, and environmental factors in TOE contexts with personal development (Awa et al., 2017). This fact strengthens the evaluating groups' conclusions about the need for technological readiness and sustainable infrastructure (in terms of continuity and maintenance) as additions in support of the teachers and educational managers' development. This construct is supported by the particularly important fact that large organizations take into account that the prospects for a stable, sustainable system that guarantees the continuity of a business depend on integrated management with strategic planning and the clear, shared implementation of actions. They also recognize environmental constraints and imperfect or incomplete powers of control. It is, therefore, necessary to build a quality organizational atmosphere that features integration between people and actions (Zsidin et al., 2005).

Table 9. Organizational and institutional complexity indicators.

Latent variable	OIC	Indicators definition
H2	H2a	Institutional isomorphism ensuring participatory management by observing regional needs and potentialities when applying resources
	H2b	<i>Principles and guidelines for quality of education</i>
	H2c	Planning and implementation in an equitable manner ensuring credibility
	H2d	Political and executive actions in accordance with the NEP, guaranteed by civil accountability of the leading managers
	H2e	Technological readiness and sustainable infrastructure
	H2f	Support for the development of technological competencies of teachers and administrative staff

H2g	On-the-spot management with the disclosure of targets, results, and use of financial resources in a transparent manner through a public progress report
H2h	<i>Management with appreciation for people and performance, adopting parameters in line with federal and local responsibilities and realities</i>
H2i	Respect for cultural aspects and regional differences
H2j	Clear and shared decision-making processes between the local and federal administrative levels.

Note: Measurement indicators adapted for Authors with contributions from the Focus Groups during the evaluation process.

H3 –BIUT is heavily influenced by the other two domains (H1 and H2), according to the discussions in the focus groups and the conclusions reached. The most sensitive indicators relate to teacher satisfaction and the expectation of improved performance, which are allied to confidence in the quality of teaching and facilitating conditions; these are concentrated mainly in the H2 construct. The same reasons explain that in any situation experienced in the business world, satisfaction, favorable expectations, and trust are always related to previous practices and experiences (Teo and Noyes, 2014).

It was evident in the focus groups' discussions that once we are able to overcome the difficulties that arise as a result of those who seem to resist changes due to a lack of skills and even fear of the advent of technology, their engagement will gradually be secured through the influence of social use and ever-growing connectivity. In addition, it was strongly agreed that motivation is bolstered by expectations of and satisfaction with improved teaching and learning performances in this new, ever-changing scenario

Cultural factors are not included, but we evidently must consider the possible impact of 8+- differences caused by this factor. Studies on technological adoption evaluating cultural differences have already been conducted in several countries (In et al., 2011). Brazil is a country with a formidable territorial extension as well as cultural diversity among the regions, and indeed, technology-related behavior also differs among teachers.

In their discussions of H3, the focus groups confirmed behavior pertaining to expectations that technology will enhance teaching performance, even requiring a higher degree of effort, which will be mitigated by facilitating infrastructure conditions. The social influence of networking is also a significant decisive factor, according to Davis (1985), Venkatesh and Davis (2000), and Venkatesh et al. (2012), who authored and developed the referenced model (see Table 6).

Table 10. Behavioral intentional use of technology indicators

Latent variable	BIUT	Indicators definition
H3	H3a	Satisfaction and expectation of better teacher performance.
	H3b	Expectation of effort required to achieve better educational results
	H3c	Social network influence and emerging digital culture
	H3d	Confidence in facilitating conditions to improve teaching quality

Note: Measurement indicators adapted for Authors with contributions from the Focus Groups during the evaluation process.

5.1 Validating the structural framework

The structural framework (Figure 7) under study is artificial and is a socio-technical process built on cause-and-effect relations, the relations between its hypotheses. It was examined considering the actual experiences of the education specialists who participated in the focus groups and the individual interviews.

Bearing the framework's usefulness in mind, all the evaluators agreed that H1, H2, and H3 represent cause-and-effect relations, thus contributing to an alternative concept of a framework for reaching the proposed goals. This verdict means that the information system that has been produced for decision-making is a viable alternative for practical application

Undeniably, the topic needs to be visible and reasonable so that evaluators can see it as an alternative solution to a real problem. Thus, the methodological proposal is evidenced as artificial science, allowing analysis based on the theoretical foundations presented in confrontation with and complemented by observations of the evaluators' practical experiences. This specific intersection constitutes the extraction and formation of knowledge supported by the explicit representation of the ideas in the form of a coherently-organized model or construct.

Finally, it is essential to recognize the DSR methodology that was used with the focus group technique to highlight some fundamental contributions arising from the discussions, many of which have the potential to be converted into reflections, strategies, and actions for teachers and educators, in general, such as:

Endorsement of the CMC construct as carrying the most critical weight for the ICC framework. This conclusion means that the formation of a superior profile of teachers is

essential, with a focus on knowledge of their taught subjects but emphasizing knowing how to integrate them with others pedagogically and, above all, creating competencies for the use of technological instructional resources.

Technology changes constantly, and unfortunately, we lose its application benefits in education due to inadequate teacher training. It is, therefore, necessary to reconfigure content curricula with a strong focus on pedagogical practices and technological skills competencies in addition to the ICTs used in social life.

In other words, there is no point in having countless technological resources and not knowing how to use them or not knowing the pedagogical path to follow. The teacher of the future will undoubtedly master technology, but they will also need integrated competencies, as validated in this project.

Due to the socio-geographical complexity, technological adoption in national public education needs to happen through a broad, well-structured planning project, in line with the ten actions highlighted in the organizational and institutional complexity indicators construct (see Table 5, p. 32).

Large multinational companies implement complex projects globally and achieve on-time execution and the planned level of quality due to managerial leadership with strategic discipline. This is also possible in large-scale education.

The numerical data the evaluators pointed out also indicated a statistically-representative structural model in which the conclusions recognized the *usefulness and potential efficacy of the hypotheses*, necessarily generating a *challenging but viable project*.

5.2 Statistical approach

A qualitative method was used in the focus groups and applied to the confirmatory factor analysis of the constructs' weights in the framework; the same analysis related to each factor's contribution to its constructs. The results are shown in Table 7.

In Table 7, given that the sample standard deviation, which is around the average of most variables, is less than 1 (except for H2b), the amplitude (the difference between the upper limit and the lower limit of the confidence interval for the sample mean) of the 95% confidence interval is also less than 1. In addition, for the experts, most variables' importance was found

to be greater than or close to 0.7; hence the variables and the indicators carry great informative weight for the construction of the suggested model.

It is noteworthy that indicators H2a, H2b, and H3b have lower averages and higher standard deviation values, as well as a load factor that is less than 0.7 means that those indicators exert a lesser impact than others in terms of the information that is necessary to understand the construct. However, the inadequacies were corrected in the evaluators' discussions, and those indicators are thus maintained in Tables 3 and 4 (pages 23 and 30, respectively), where they have already been altered as per the corrections.

It is also worth noting that the weight reflecting CMC's importance compared to OIC and BIUT, due to the expressive load factor (0.937), confirms the emphasis and qualitative reasons attributed to teachers in the evaluated structural model. Considering the remarkable importance that the focus groups have placed on CMC, we feel justified in believing that:

- The evaluators acknowledged that the measurement indicators H1a, H1b, H1c, and H1d correlate qualitatively and, together, strengthen hypothesis H1 around the existence of the ICC concept, which was the study's conceptual focus. The better the competence defined in each measurement indicator, the better the quality of the H1 construct.
- The statistical interpretation confirms this linearity relationship since the value of the R-Linear association is positive, ranging from 0.41 to 0.73, thus indicating that the associations range between moderate and high. See the linearity relationships in Table 8.
- By abduction, if the indicators, respectively, explain H1, they can also be considered correct.

Table 11. The construct's strengths and their measurement indicators.

Variable	Statistic		
	Average	Standard Deviation	Load
CMC	3,75	0,413	0,937
H1a	3,85	0,366	0,962
H1b	3,75	0,444	0,937

H1c	3,05	0,759	0,762
H1d	3,45	0,759	0,862
OIC	2,95	0,510	0,737
H2a	2,55	0,825	0,637
H2b	2,45	1,099	0,612
H2c	2,85	0,810	0,712
H2d	3,15	0,812	0,787
H2e	3,25	0,638	0,812
H2f	3,55	0,686	0,887
H2g	3,15	0,812	0,787
H2h	3,35	0,670	0,837
H2i	3,60	0,680	0,900
H2j	3,20	0,767	0,800
BIUT	2,72	0,850	0,681
H3a	3,05	0,825	0,762
H3b	2,30	0,934	0,575
H3c	3,00	0,858	0,750
H3d	3,30	0,864	0,825

Note: Load values expressed by Focal Group evaluation

Table 12. Linearity relationship between CMC indicators

	CMC	H1a	H1b	H1c	H1d
CMC	1,00	0,30	0,50	0,63	0,46
H1a		1,00	0,73	0,41	0,44
H1b			1,00	0,51	0,51
H1c				1,00	0,69
H1d					1,00

The analysis results showed the importance of the role played by teachers in this alternative framework of technological incorporation in educational processes, adding value

and outcomes to the ICC profile. Initially, CMC (H1) were confirmed as comprising the most critical framework constructor. There is a consensus that the teacher's role is ahead of organizational resources for teaching. Moreover, CMC also include motivation and self-efficacy as driving forces for teaching activities under any circumstances.

Furthermore, the focus group specialists' evaluation evidenced that teachers' mediation is the newest and most crucial role that has emerged in the partnership between education and digital technology.

Thus, assuming the role of the teacher presents an even bigger challenge. Especially for most digital immigrants because, according to Bandura's (2001) concept, the agency perspective involves the ability to deliberate on, choose, predict, plan, and regulate courses of action instead of passively waiting for them to happen.

In light of Schulman's concepts, pedagogical mediation meaning the ability to apply and develop a repertoire of situations to facilitate learning must be accompanied by an inspiring, motivating attitude among students. Hence, it is significantly vital to have a leadership profile that mobilizes capacities built on the teacher's underlying characteristics, thus allowing students to perform well while also mobilizing intrapersonal and interpersonal competencies, which are known to constitute emotional intelligence (Goleman et al., 2013). In this challenging context, a teacher's self-efficacy is a jewel in their profile

The organizational and institutional complexity (H2) predicted in the research was discussed and evaluated using indicators that represent the best description of the real terms and opportunities for executing a technological adoption project on a large scale of complexity.

In addition to the discussions qualifying the profile defended in the CMC, we also highlight the most relevant statements from the OCI construct for planning the adoption of a technological teaching system in a broader educational order, such as in Brazil:

- Principles and guidelines should direct education rather than the previous form, which was guided by normative rules and execution pressures.
- Education, as a transformative action, does not transfer knowledge. However, it must deal with teachers' mediation of the world outside the school, seeking integration and technological assimilation, and developing an innovative spirit in an environment of open participation with all those involved in taking up responsibilities.

- Institutional isomorphism ensuring participatory management by observing regional needs and potentialities when applying resources.
- Principles and guidelines for quality education.
- Management with an appreciation for people and performance, adopting parameters in line with federal and local responsibilities and realities.
- Clear decision-making processes that are shared between the local and national administrative levels.

These thoughts firmly guided the project's vision. In order to facilitate these in the context of a complex institutional process, it is necessary to identify the cultural elements and strategies that are increasingly appropriate for humanizing individuals. The digital revolution that produces new forms of communication and social relations must incorporate speed and quality into educational processes.

Finally, observed as a motivation conclusion, despite current feelings and the lack of recognition for teachers' status and professional conditions, the third evaluated construct, behavioral intentional use of technology (H3), confirmed the high expectations and level of motivation that a project like this conveys to its actors. This project could ensure hope for the effort expended towards and confidence in facilitating the best quality of teaching, which is required to achieve better educational results for all.

6. Conclusion

This paper aimed to validate a framework for the pedagogical application of ICT in teaching and learning processes. The analysis points to the role teachers play in this alternative model of incorporating technology in educational processes, adding value and results to the CCI - Integrated Cognitive Competencies profile. The evaluation of the model by experts gathered in the Focus Groups showed that teacher mediation is the new and most important role in the partnership in education and digital technology. The high level of experience and background of the content of the participants allowed clarity and conciseness in the discussion process. The proposed framework combines educational references and Design Science Research methods, and it was tested and improved using focus groups composed of education specialists who evaluated the frameworks' various constructs.

The results indicate that the proposed framework is feasible, viable, well planned, and anchored in ICC, which can add value to educational processes. The model also facilitates individual and collective contributions to the orderly improvement of learning processes towards the attainment of better results in regard to teachers' self-efficacy. Another valuable contribution of this study relates to teachers' cognitive and behavioral focus within their integrated and independent institutional and organizational environment.

As already argued, we have to reinforce the executive limitations of this challenging proposal for technological adoption in a large-scale system: they are centered on the need for a great effort of managerial and political leadership, supported by public policies that guarantee balanced sustainability between resources and legal responsibilities, assigned, and distributed by the state, or by a governance system in the case of private organizations. Despite this fact, in the future, according to the methodological DSR principles, as delineated in the research plan (Figure 1), the subsequent work will be a dissemination proposal based on this paper. With regard to the Brazilian National Educational Plan (NEP), there could be a project of technological adoption in education that effectively meets the institutional principles, thus avoiding the risk of an irreversible deepening of the developmental delay in the current system. This initiative could be the best way to improve the ideas generated by the current proposal due to the significant involvement of the educational demands.

It is also important to reinforce that the pedagogical monitoring project that the OECD announced in 2019 will undoubtedly add value to educational processes in a global context, particularly through the exchange of comparable experiences among the participants' countries.

Chapter 5: Digital culture, behaviour, and consumption: Communication & Marketing building the future.⁶

Contemporary coexistence points to digital technology as an essential engine of multiple and constant social relations changes, living, and thinking about the future. It is undeniable that a menu of novelties is always being prepared for our consumption, offering, generating comfort, and improving the quality of life. However, the crucial problem is overconsumption, causing socio-behavioral and environmental imbalances and a more significant amount of waste and loss of control with the management of finite planetary resources.

Undeniably, the competencies arising from Communication & Marketing processes significantly impact the volume of global consumption and the formation of consumer behaviour through technical and psychological processes that drive the human will to have and be. This chapter covers a study by evaluating the appearance of competencies in Marketing & Communication and their persuasive potential of contributions to building the future through the educational process of students, discussing the ethical and moral values that they can and should apply in their professional lives. A focus group from one of the best classified Brazilian Universities will present a significant critical evaluative contribution to the ethical issues of our current consumption.

5.1. Introduction

These difficulties even include the surplus of digital communication, and the computational resources consumed are the price to pay for real-time interaction with multi-channel alternatives that bring people together on local and global networks. A new language has emerged with images and artistic representations of reality fed by attractive and stimulating devices that bring together the growing waste disposal and complexity.

However, the advent of Covid-19 adds additional complexity to the changing social profile, posing questions and uncertainties in previously dominated and predictable situations.

⁶ Context taken from the article “Communication & Marketing teaching and learning: outstanding performance with ICC- Integrated cognitive competencies” (under revision).

Strategic planning has already had to include this new reading and understanding of the here and now at the global level and, simultaneously, ascertaining the competence of seeing local relativism. The complexity of these relationships, added to new and unexpected behaviors and requirements resulting from the empowerment of the virus as a key player in an insignificant market change, justifies rethinking the skills needed for development in corporate and academic universities. After all, we are new animals living in new fields.

The present already challenges us to solve the difficulties of planetary coexistence in which the natural search for comfort for life in the biosphere has led humanity to succumb in the face of not knowing how to manage excesses and orgies of consumption exploring finite resources to degrade and destroy sources to guarantee the future. It is not just about finding technological solutions but educational alternatives that arouse awareness and knowledge to reach the future (UNESCO, 2018).

Communication & Marketing can significantly contribute to the transformations that should give a new profile to our planetary coexistence.

Thus, this section of the dissertation has the firm objective of rethinking its role in light of the concept that defines competence as knowing how to act with responsibility and not just knowledge, thus becoming a competitive differential based on the strategic need to transform the present and see the future. Technology, innovations, and differentiation to meet consumer expectations raised the cognitive level of communication and understanding in consumer dialogue and engagement, requiring an integrated approach to learn new knowledge, skills, and attitudes in this new application of ICC - Integrated cognitive skills.

The study aims to encourage students, teachers, and professionals in Communication and Marketing Management to rethink the values in this relationship with consumers, reviewing the contributions that digital technology can offer in this challenge but pedagogically contributing to the teaching and learning process within ethical concepts. This rethinking should help answer how learning integrated cognitive skills can be decisive for forming a high-performance profile.

Methodological, quantitative, and qualitative techniques support the study. In the first, an evaluative questionnaire will map the degree of agreement of students and Communication and Marketing professionals on questions extracted from the academic and professional

literature (agencies) related to the Teaching and Learning profile experienced by the respondents. An alternative structural model based on DSR - Design Science Research will indicate the assessed objective composed of hypotheses organized by constructs that condition the situations in causal relationships that lead to the highlighted performance perspectives.

The validation of the proposed action model, in the first stage, is through Smart PLS version 3.2.9 and later discussed and confirmed by a Focus group composed of professors and specialists in Communication and Marketing, given the new reflections and contributions arising from the influence of new values learned from the severe impacts of Covid-19.

5.2. Ethics, consumption, and planetary sustainability

The conceptual project MIL cities - Media Information Literacy supported and developed by UNESCO seen in Yanaze and Ortiz (2019) addresses the line of concern with technological and innovative development; however, in an integrated way between social diversity and its cultural relations, building new identities in the various virtual ecosystems and the physical space of habitation in which humanization takes place and develops. The concept involves new technologies associated with ethics that guarantee sustainability and social harmony.

An important aspect to be explored in this article is the inclusion of marketers as one of the protagonists of the process of social transformation according to the concept of MIL cities (Yanaze and Ortiz, 2019):

The inclusion of action in the physical and digital spaces of both traditional actors and informal education, that is, schools, universities, teachers, students, family members, as well as marketers, journalists, public and private institutions, creating networks of researchers, activists, ecologists, entrepreneurs, government officials, policymakers, electoral commissions, transportation systems, public health, artistic and cultural groups, NGOs, class associations, libraries, museums, community projects, etc. All to educate and transform the city and its residents.

It is undeniable and almost common to say that we live in a new world with digital technology transforming our habitation and forms of coexistence in the new millennium. Real-time communication and the new ecology of network life supported by big data, clouds, augmented reality, global social networks, the internet of things, and many information systems

and applications command many of the human actions from cell phones. We are new animals living in new fields.

Enriched by the images and approximations of people in networks, real-time communication has created several alternatives of channels and communicative spaces, strengthening the human relationship on a global level. One of these spaces or categories, which positively steals our attention in this work, is consumption and, notably, the forms of relationships involving the market, brands, products, consumers, and, undoubtedly, the cognitive complexity added by technology in the lives of the people involved in these processes.

Not everything, however, is just joy. As predicted by Negroponte (1995, p.215), “I am an optimist by nature. However, every technology or gift of science has its dark side, and digital life is no exception.” He already foresaw that we would experience cases of intellectual property abuse, invasion of privacy, and digital vandalism - which we can attribute, for example, to the significant setback of fake news, as well as to other factors that hinder social development.

As a starting point for this understanding, we can look carefully at communication as a process of exchanging coded messages between communicators through a channel within a context aimed at achieving certain objectives (Souza, 2006). According to Gill and Adams (1998: 41), the social activity of exchanging meanings in a cultural context in which it is not always codified and does not always have an emitter. This occurs from the concept that can acquire meaning for the recipient from the point of view that the world is the message, interpreted in its varied meanings and thus understood (Souza, 2006).

In consumer relations, communication is ingrained with Marketing, which directs it within the processes of innovation and relations with the market value chain, notably with the key elements of this relationship: consumers. Thus, marketing, seen as a process that correlates people, products, brands, consumers, and markets, among other variables, works with all this involvement in exchanging messages and meanings, in addition to the emotion and feelings of the audiences involved.

In this way, the knowledge of Marketing as a fully cognitive process dominating market knowledge, consumer behaviour, brand communication techniques, and persuasion exerting a profound influence on creating consumption consolidation habits and, if it were not enough, further developing this dependence.

5.3. Communication and Marketing and the paradigmatic organizational changes

According to Keller (2003), beliefs and attitudes established in the minds of consumers cannot be easily reproduced in contrast to things manufactured in the production processes. It is precisely there where all the marketing knowledge is applied, mainly when the difficulties and pressures for profit need to be overcome. We are, in fact, within the thinking of marketing, facing competencies that involve the design and implementation of programs and activities aimed at the construction, evaluation, and strategic management of brands and, consequently, business results.

Marketing deals with social inequalities and differentiation, trivializing them and making them appear natural in the competitive and meritocratic environment.

According to Morin (2005), the self-affirmation of the Being-subject represents, at the same time, a principle of inclusion and exclusion, whose mechanism, in essence, means a constant reconnection of the I-subject with the We-society. According to the authors, the Being-subject always seeks its updating and social inclusion by “consuming” social references in the world around him. The communication of the brand's personality makes people feel better and deserving of the consumer's power, without blame, and always full of hope in having the self-image they always seek. (Su, & Reynolds, 2017); (Sahour & Dragomir, 2018).

Consumption alone is already an essential understanding given its complexity in social life, impacting global individual, collective values, and economic aspects. Consuming is part of the routine acts of our lives. We rarely stop to think about which ones were essential (Braga, 2020), although, for Bauman (2008), we cannot separate the act of consuming from the human biological condition, whose reflection leads us to evaluate whether we are being taken to consumerism as a way of being and being of the human being and also how to identify when we are being consumed by the objects carried by the influences of social belonging and uncontrollable desires arising from the self (Campbell (2006).

According to the author, this yes arises from passionate consumption in modern life, which is not passive but stimulated by the search for pleasures and new sensations and is totally due to subjectivities and individual orientations. Still, according to Campbell (2008), as seen in Braga (2020), this culture is an extension of the self, in addition to expressing our identities, fills social and personal gaps, satisfying anxieties and desires, compensating feelings of loss

and inferiority, among others. Campbell identifies a modern hedonism, in which individual subjectivity is extended and trivialized in society.

What should be an act of simple living or sharing life in the social sphere has become, according to Fontenelle (2007), a social act par excellence, making marketing research concerned with the consumer's desire as the primary source of your charges for the creation to be returned to the market, and not necessarily your needs. A typical characteristic of searching for opportunities to create desires and not to satisfy them, which Campbell (2001) categorizes as romantic ethics with values linked to pleasures and the incessant search for novelties and transforming dreams into commodities.

In our study, we can conclude this brief profile by recognizing that communication and marketing remained the opportunity to explore fertile land produced notably by the biological need for inclusion and secondarily by the desires created by human weaknesses themselves. This deserves a reflection of our contemporaneity. We cannot fail to recognize the space of absence of education for consumption linked to the thought of planetary sustainability exhausted in its finite resources (Braga 2010; Campbell 2006) and taken by the global culture with offers and consumptions of brands and customs today shared in scope worldwide.

Process management initiated in the nineties rebuilt organizations by bringing together complementary and supportive activities through the flow of information between one and the other. It was not a question of automation of operations or a new way of managing but of discovering what was being done and what should be done to act directly on changes in operations (Smith & Fingar 2003). Functional knowledge mobilized the formulation of the business management process, and, within this context, all roles performed in a non-hegemonic and absolutely integrated manner.

Several authors, among them Paim, Cardoso, Caulliraux, & Clemente (2009), point out the direct link between the process management model with organizational and human development for some reasons:

- Impossibility of working focused on processes and organizing them in isolated functional operations, whose design characterizes Fordist-Taylor models that did not look at the whole but the online parts;

- The need to act in an integrated way, influencing the organizational culture to think of the whole, interconnecting operations within processes, and creating interdependence;
- People no longer work in isolated functions but use their specialties, generalisms, skills, and experiences within the processes and cells they are allocated, but with a view of the whole. Basically, this is the new competence that emerged in this context. Process management works at the expense of human interactions and the ability of individuals to act in collective constructions. This is fundamentally also true for managers.

Also, according to Smith & Fingar (2003), business processes move as changes happen through the interaction of people with the environment in the multidimensional space of time and structural evolution of the organization. Thus, monitoring is necessary to know the right time to modify or improve business processes and how to change them quickly (Kirchmer, 2015).

The most noticeable and influential movement for organizational change was caused by the consumer, who started a revolution for his rights, forcing companies to prepare for this meeting. The world has changed with globalization, both in resizing markets and in approximating desires and possibilities of consumption. Competing for the future became a point to learn from Hamel and Prahalad (1995). For that, it was necessary to plan, but, above all, to discuss their own organizational weaknesses and restrictions in-depth, verbalizing their own intuitions about what to do (Goldratt, 1990).

The ideas that came with Prahalad and Hamel (1990) and Ulrich (2000) about essential competencies and competitive advantages showed how they advanced in this period the valorization of differentiation and organizational change processes driven by the need to seek consumer understanding and conquest.

Several authors, including Gomes, Borin, Barella, and Soares (2008), define these competencies as the strategic combination of resources, skills, and organizational processes that, guided and integrated, will meet the needs of customers differently, to the point of generating the creation of perceived values in this relationship in concrete and loyalty-generating manner, according to concepts explained by Prahalad & Hamel (1990) and Ulrich (2000), as shown in Table 13.

Notably, Ulrich does not even refer to knowledge management but rather to individual competencies that result in organizational ones to materialize from a process of interaction and the complementation of the skills and experiences of people and groups in the organization, as shown in Table 13.

Table 13. Essential concepts of organizational competencies.

Prahalad & Hamel⁶	A set of skills and technologies that generate a competitive advantage source can hardly be copied and contributes to the value perceived by customers.
Ulrich⁷	Individual skill sets, which are stable organizational competencies, cannot be easily copied.

Note: Authors aiming to stress the importance of these concepts

Large corporations capture these intellectual assets from individuals through the interaction between organizational groups, through an intelligent mapping of all their resources, and organize them in records and information systems for use in the growth process and organizational sustainability. This is undoubtedly one of the greatest challenges to the talent of contemporary business leaders. Understanding and relating the correctness of the processes and subprocesses with the organizational competencies is necessary.

John Dewey expressed the classical concept of competencies during the Education Renovation Movement, in the United States, in the late nineteenth century, inverting the pedagogical action of the traditional school by placing greater emphasis on practices and projects. Thus, in addition to leading students to find meaning in school content, he uses problem-solving methodologies to deal with the change and uncertainty of an unpredictable world (Dewey, 1959).

Following this path, the main contents used in this work followed for the funneling of the study of the determinant competencies in Communication and Marketing Management for outstanding professional performance, which according to Dewey 1959; Zarifian 1999, Le Boterf 1995; MEC 1996, competence is:

- Result of explicit and evaluable practical action;
- Transcendent of routine tasks minimally allowing for problem-solving unusual through the interrelationships and analysis of experiences;

- Initiative in the face of problems and events in professional situations;
- Practical intelligence supported by knowledge and experience and transformed into actions;
- Faculty to mobilize networks of actors, share challenges, and take responsibility in professional situations.

Closing the concept, we adopted a definition that summarises the previous ones. We added two points of great importance to the corporate market on the occasion of their disclosure by their authors (Fleury, M.T.L., & Fleury, A. 2000), as shown in the following illustration:

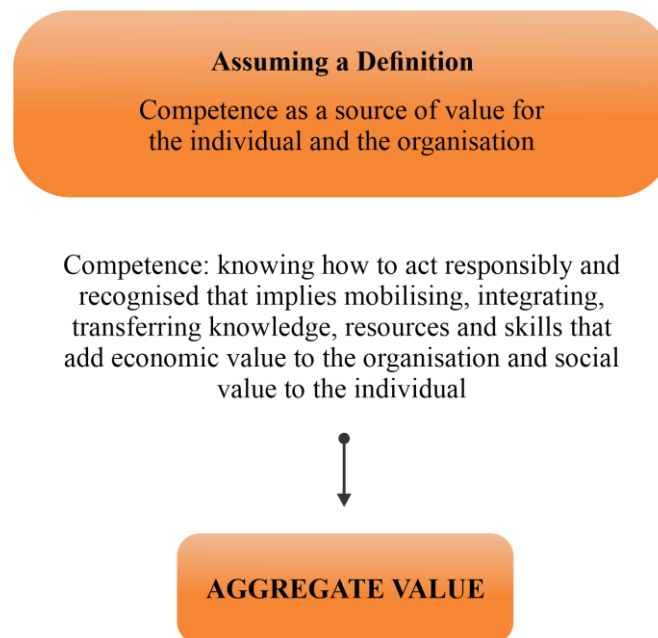


Figure 18. Summary competence concept adopted to guide the present study. Authors.

This concept also marks the period of business valuation of Management by Competencies and differentiation of performances in the context of process-oriented organizations, as discussed in the following session.

5.3.1. New forms of work organization

Meeting the new demands of consumers and new levels of competitiveness created the need for new behaviors combined with new knowledge, skills, and attitudes of greater

participation in the collective effort to obtain better results. Then new forms of work organization emerge.

The first vigorous change was the perception of the need to mobilize a strategic whole to pursue organizational objectives by reviewing and aligning corporate philosophy with new market behaviors dictated by consumers. Thus, we will use an example of a pattern of action for change pedagogically, verified in some international consumer goods companies, starting in the nineties, inviting the reader to observe that the focus on functions has been replaced by the construction of new, more comprehensive, and strategic processes.

Our focus will be on the organizational constructions and impacts generated and attributed to Communication and Marketing management without detailing the historical process of change, given that it is not this study's not objective.

Figure 18 illustrates the essentials of the change process as a whole:

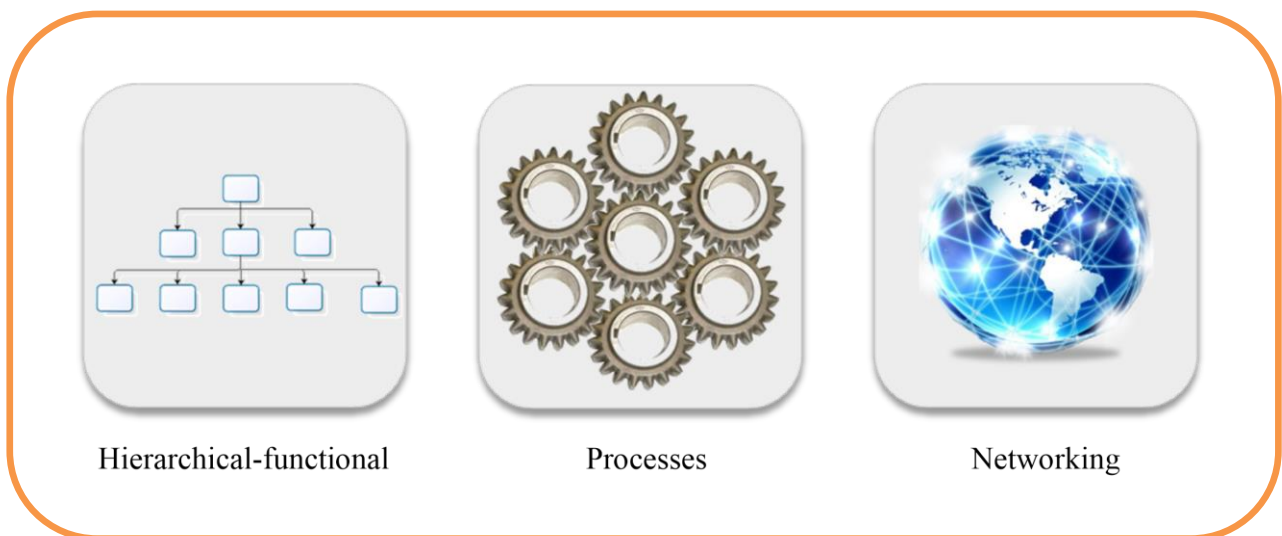


Figure 19. The change process and the organization models. Authors.

Note: The three chronological stages of the organizational change processes.

The relationships produced in each of the models above can be clearly characterized as follows:

Hierarchical-functional: excellence in functions; the parts do not always see the whole; relationships typically feudal and originating from Fordism-Taylorism.

Processes: the individual is empowered in the group; set of individuals is the new minimum unit of the organization; creativity with interaction and cooperation of ideas, symbolized by the gears that touch and move the whole. The central gear represents the corporate governance process - attributed to Leadership and Strategic Management - constituting today's pillars for the sustainability of organizations with recognized social value. According to Kaplan and Norton (2006), all organizations put strategy at the center of their models so that the strategic whole is correctly communicated and shared with all levels.

Networking: organizational communication is the thinking and doing of people in a network; experiences align with common goals; transformations create a local and global culture. Currently, there are global processes with a leader posted in a region and his team spread and working worldwide.

5.3.2 Communication and Marketing at the center of transformations

In the new organization, the key process for meeting customers and consumers was called Brand Development and not simply Marketing, bringing together the following sub-processes: brand management, product development, packaging development, market research, consumer activities, and communications and innovation center (previously linked to the factory operational area).

The figure below represents the alignment of the Structure, processes, and Culture re-established, focusing on key strategies for serving consumers. Brand Development, Organizational Communication and Technological Information, and Human Resources, took the lead in driving organizational transformations

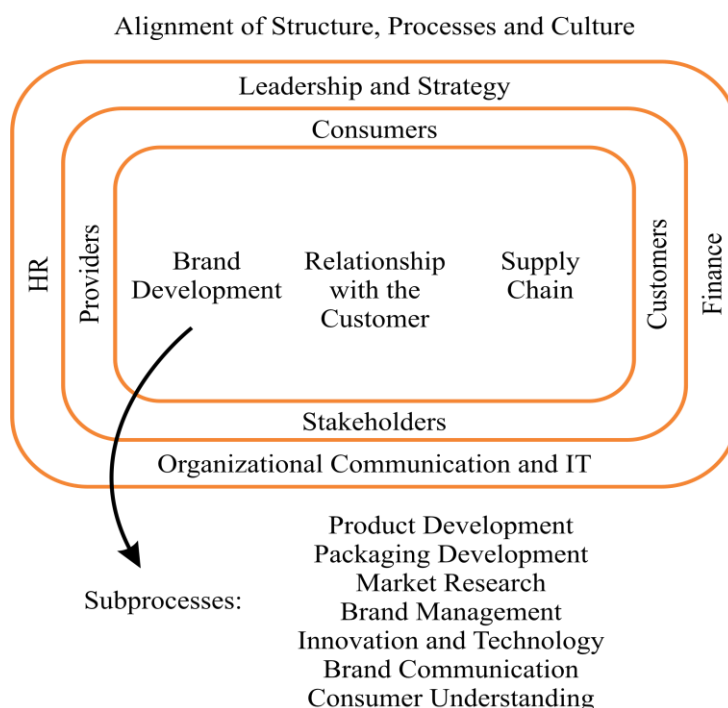


Figure 20. KBPV – key business process framework. Communication & Marketing organizational alignment with a focus on Brand Development⁷.

Note: Authors adaptation according to footnote number 7.

5.3.3. *Communication & Marketing in the Digital Revolution*

The challenging question is exactly this: the proposed reflection being made within the context of marketing and communication in real-time, driven by the most diverse and innovative technological tools coexisting alongside traditional practices, whether due to the lack of investment capacity in technology and/or difficulty in allocating talents for the best performance in these tasks.

In fact, consumers installed themselves in social networks due to the technological opportunities and began to place their content of interest in all the created spaces. Companies

⁷ Figure reflecting the Organization Change Management Process applied in the Elida Gibbs Division of Unilever Brazil during the second half of the nineties .

This was a collective effort led and supported by the CEO of the Unilever toiletries division, Mr Vinicius Prianti, that some years after assumed the Presidency of all Unilever companies in Brazil.

and consumers found themselves in this ecology of networks in a highly interactive way, assuming an increasingly active role in co-creating almost everything, from product design to promotional messages, according to Berthon, Pitt, McCarthy, and Kates (2007), mentioned in Hanna, Rohm, & Crittenden, (2011). In this regard, the authors cited in this article developed a more in-depth study on the most creative and engaged consumers, becoming even what they classified as creative consumers who adapt, modify, or transform a product or service offered, representing another side of the ongoing phenomenon.

Hanna, Rhom & Crittenden (2011) note that marketers use people and community platforms to create experiences that achieve the goal of attention and generate influence by mobilizing the opinions of “consumers who help companies determine future initiatives, products or services ”(p. 4).

The market scenario is far from looking like a brigadier sky for clear and calm flights. More important than Marketing planning, we bring with Scot & Kubo (2011) that flexibility and reaction capacity become indispensable as a competitive advantage. According to the authors, the real-time mentality is not yet in executive practice and not even in the curricula of specialized schools, as too much time is lost in decision-making, “overestimating risks and minimizing possible benefits.” The authors continue claiming that the decade-long revolutionary technology allowing to gather, interpret and react to new information in real-time has made this a currency of success, which for Marketing and Communications is essential to understand as a business now unfolds “from minute to minute in real-time, driven by their talking customers and no longer guided by the mass communication that their budget can buy.” Scot & Kubo (2011, s.p.)

On the other hand, even in 2004, in his book “Answers to Your Questions on Marketing, Kotler said that the practice and performance of marketing would be revolutionized by computing, transforming the market more quickly than marketing itself and that “new technologies would favor direct marketing more to the detriment of mass marketing ”(p. 64). He cites computers sold outside of retail as a good example and customized to the consumer's wishes. He also points out that the growth of efforts in branding is justified since brands are the main defenses against the competition, mainly in terms of prices and “despite having been built by performance” (Kotler, 2005, p.65).

This strategy centered on brands has been demonstrated with the great growth of the creation of specific websites and blogs by brands (Kotler, 2005), whose identification with unique effects brought by the various marketing actions constitutes the brand equity that strengthens the value of these brands together to consumers (Keller, 2009). The author complements that one of the main benefits of building a strong brand comes from the increase in the communicative strength of marketing and the greater willingness of consumers to accept it, follow it cognitively, and remember it, facilitating other objectives with additional communications.

A contemporary model, which is quite didactic to explain the scope of marketing and its interrelation with Communications in the organizational context, comes from Yanaze (2011), pedagogically called the 3 Puts Model, thus summarized and illustrated in figure 20.

- Inputs: Financial, human, material, technology, knowledge, and information applied in the company's systemic flowchart to produce results.

- Throughputs: processes such as supply chain, brand development, customer relations, systems and administrative, financial, people management, community relations, organizational culture, and business climate; in short, the whole chain of mobilized actions in the production of the results.

- Outputs: what is offered to the consumer market as a product, price, place (distribution), and promotion (communication), in other words, the 4 Ps of Jerome McCarthy (1965). Obviously, distribution is a process that is technically included in the extended supply chain, but in this case, here, within the 4Ps highlighted as a result in the final marketing chain. In the same way, Communication is also understood as part of the corporate processes and, therefore, seen within the activities mobilized as inputs in the general context; here, it is also highlighted in the actions delivered to the consumer as a result and significant output.

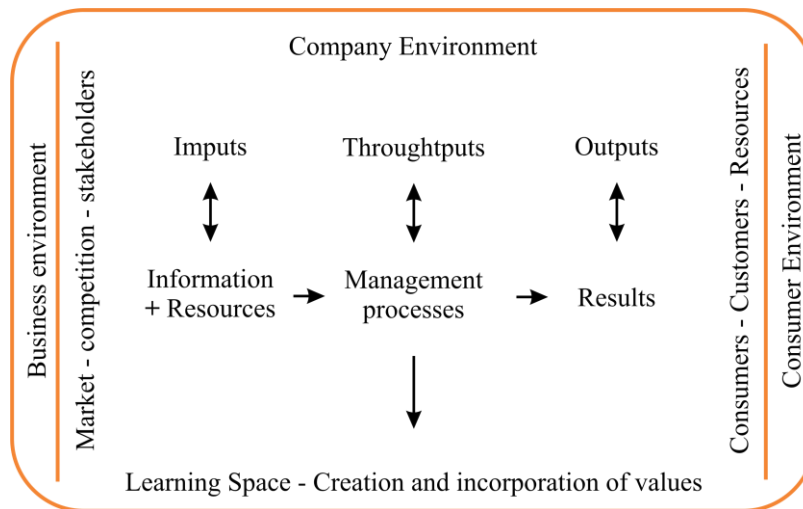


Figure 21. Illustration of the Company and Market environment into Yanaze's "3 Puts model"

Note: The authors value the attention to the throughputs space, which is also the management processes and consequently the learning space responsible for creating and incorporating value.

In this session, a study was conducted to encourage students, teachers, and professionals in Communication and Marketing Management to rethink the intervening values in this relationship with consumers, re-examining the contributions that digital technology can offer in this challenge but in a pedagogically contributive way to the teaching and learning process. This rethinking should contribute with answers on how the learning of integrated cognitive skills can be decisive for forming a high professional performance profile, however prevalent social values of ethical coexistence for constructing a planetary society. In other words, the strategy for this discussion was to add to the ICC construct the issue of ethical concern taking into account the moral values that are expected to be important in the context of citizenship for a planetary society.

Methodologically, the study is supported by quantitative and qualitative techniques. In the first, an evaluative questionnaire was used to map the level of agreement of students and Communication and Marketing professionals on questions extracted from the academic and professional literature (agencies) related to the Teaching and Learning profile experienced by the respondents. The most agreed profile pointed out by the estimation of the model/framework through the PLS application was examined in discussions in a Focus Group made up of professors and experts in Communication and Marketing who also contributed to the study's

conclusions. An alternative structural model was constructed, composed of the conditioning hypotheses of the situations in causal relationships that lead to the objectified possibilities To explain the evaluated objective.

Finally, for the formulation of the hypotheses examined in this study, we are left with the observation that the communication approach between brands and consumers (outputs) as well as between customer relationship processes and distribution channels (throughputs) established new ways of doing business demanding new and differentiated skills driven by digital technologies and systems that revolutionized the relationship between the scope of the marketing function in the organizational context and the market (Kotler, 2005).

5.4. Outstanding performance in Communication & Marketing: Study Hypotheses

The new design of the markets affected by digital communication requires the learning and development of Integrated Cognitive Competencies (CCI) in Communication and Marketing, which are decisive for directing disruptive actions in the competitive environment driven by innovations and differentiation. We must start recognizing that the best results in Communication and, consequently, of the products created by Marketing starts from the premise that everything is communication and meaning and "the world is only intelligible and understandable because we assign meanings and interpret them" (Souza p.22). The author shows that the process added to the social activities of exchange and meaning influenced by different cultures results in cognitive effects that allow our understanding of the world from our interpretation and understanding within this process.

The framework applied to Communication & Marketing educational processes considers this cognitive premise and other specific contents as follows:

The conceptual model establishes hypotheses in which the behavior of high professional performance in Communication and Marketing goes through three dimensions that represent situations of cause and effect to be fulfilled so that the result brings together prospects of achievement.

These constraints are a) the domain of cognitive and motivational competencies represented by the measurement variables contained in the constructs that are the competencies mobilized in the actions of the teaching and learning processes of teaching and learning b) in the organizational conditions of Teaching and Learning, necessary for the best fulfillment of

quality academic activities in professional training in Communication & Marketing and c) in the assimilation and incorporation of skills explained in know how to act that is configured in the professional practice of accumulated and continued learning in the post-school phase real prospects for differentiated professional performance.

In the three domains presented in figure 6, we emphasize that the learning of Communication & Marketing, as well as the assimilation of professional practices resulting from the study of this discipline, requires significant cognitive competence for understanding the procedural mechanism of the distinctions and uses between information and communication, as well as in the practice of identifying meanings permeating differences between cultures.

The built model is alternative and obviously does not include all the conditions to guarantee a professional performance with differentiated performance. Still, it draws a profile of interrelated causal conditions that, if satisfied, potentially indicate the determining factors for success and the production of high professional performance in Communication and Marketing activities. Figure 21 illustrates this idea.

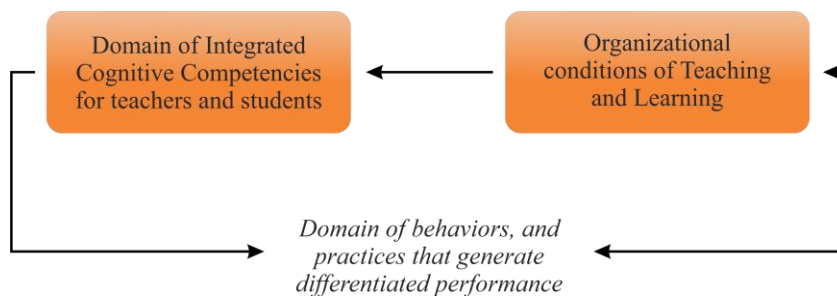


Figure 22. Causal relationships to be assessed in the 3 dimensions of the conceptual model

The causal relationships that make up this idea are in the six constructs described below, composing a theoretical model of latent variables linked together by forces to be evaluated and formed by measurement variables identified by observable behaviors or actions collected through a questionnaire. The interactions expressed in the framework represent the hypotheses evaluated quantitatively through Smart PLS, version 3.2.9.

C1: TICC construct - Teaching Integrated Cognitive Skills, including the use of digital technology: banks, processing and storage of data and information, and their selective and

appropriate use in the management of Communication and Marketing. It has a decisive influence on student education.

The application of TICC is present in the appropriate pedagogical use of digital technologies in communications with customers, consumers, and the market. Competencies in the service, consultation, reading, and interpretation of databases, intelligence, and information systems for decision-making, applications, and computational tools and technologies for strategic alignment and elaboration of graphic and creative processes. These conditions must be aligned with the most profound possible knowledge of the subject to be worked on as a theme, assisted or not by specialized advice, a prevalent aspect in this field due to the numerous specializations present.

The construct comes from an initial adaptation of the TPACK model by Koehler and Mishra (2007), modified to use technological, pedagogical, and content skills instead of knowledge as in the original framework already presented in previous work (Wiziack, & dos Santos, 2019). In addition, the ideas of structured motivation brought by Bandura's concept of motivational self-efficacy (1997; 2008), as well as the ethical and self-critical sense added to the professional profile, moves the understanding of adding value to one as a planetary citizen and society (Fleury 2000 and L Taille 1996).

The TICC predicted in this work as the construct that theoretically has the greatest strength to leverage a professional's differentiated performance is also differentiated to work in a disruptive context present in the processes involving Communication & Marketing (Crittenden, V, & Crittenden, W. (2015).

Measurement indicators:

- C1a: Mastery of available content in Communication & Marketing is essential for managing process variables.
- C1b Are determinants for effectiveness in results: mastery of the pedagogical application of digital technologies, understanding their effects and objectives.

- C1c: Competencies related to self and people motivated by self-efficacy add to the formation of entrepreneurial and ethical behavior

C2: SES construct - Competencies in observing, researching, and accompanying the changing social and economic scenario, notably driven by digital technologies and connective communication in all its forms. It positively influences the choice of actions aimed at consumer satisfaction, according to references such as Bhattacharya & Sen (2004); Kotler & Armstrong (2003.); Carrol (1999); Silva et al., (2012); Rizzo (2017); Moraes, Braga Junior & Lourenzani, (2015); Lepthien, Papies, Clement, & Melnyk, V. (2017).

Action's characteristic of this competence refers to the recognition of details of the market in which it operates: leading players in their strengths and weaknesses, new entrants to the market, blogs and websites related to their business, and monitoring the intelligence data produced.

Measurement indicators:

- C2a: Observe, research, and interpret the social and economic scenario in transformations
- C2b: Evaluate and interpret research on its metrics and effects designed for society and target audiences.
- C2c: Monitoring results, blogs, and intelligence data captured in the market and at points of sale helps to understand trends and changes.
- C2d: Interpersonal communication skills and intense participation in social networks and blogs of interest to the business.

C3: CCU construct – Competencies in: Understanding the consumer and customer. It strongly influences strategic actions to meet the expectations and level of service expected by customers and consumers. Understanding the consumer and his behavior throughout the chain of contacts are some characteristics of this competence., C

Measurement indicators:

- C3a: Research and understand your target audience's current and future consumer behaviors and needs.

- C3b: Study of preferences, attitudes, and behaviors demonstrated in manifestations on social networks, blogs, and brand and relationship sites, as well as mass media.

- C3c: Development of contact skills and observation of consumer behavior in shopping experiences.

C4: OCI construct – Competencies related to the so-called sense of owner or Ownership, Communication, and influence: It positively influences the learning of marketing processes and the strategic application of persuasion and influence of communication with consumers and the market, directly impacting the business results. Some characteristics refer to the detailed knowledge of the business, working for results seeking innovation and mastery of the information of the business environment with attention to the networks, consumer engagement, and generating value for the business with references in Foroudi, Gupta, Sivarajah & Broderick, (2018); Prentice, & Loureiro, (2018); Shankar, & Jebarajakirthy, (2019).

Measurement indicators:

- C4a: Respect cultural aspects and regional differences between customers and consumers

- C4b: Act and/or participate effectively in trade marketing actions, adequately knowing the clients' needs and projects.

- C4c: Detailed knowledge of the business and strategic variations adopted in the operations.

- C4d: Skills in generating persuasion in your interlocutors and in arguments for presenting ideas.

- C4e: Search for relevant feedback, listen to criticisms, and suggest sensitivity to understand the target audience's statements.

C5: TLO construct – Organizational conditions for Teaching and Learning based on the belief and practice that a pedagogical project properly established in line with the practical perspectives of professional life have a fundamental influence on achieving educational objectives in Communication & Marketing. In this sense, the C1, C2, C3, C4, and C5 constructs that belong to the Domain of Cognitive and Motivational Competences attributed to teachers

and students impact their reflective indicators. Inspired by the model of technological adoption in education by: Tornatzky & Fleischer (1990); (TornaVeiga, (2005); Ching, Da Silva, & Trentin, (2014); Vefago, & Francisco, (2017).

Measurement indicators:

- C5a: Pedagogical project aligned with quality academic teaching practice, guaranteeing teaching skills and adequate instructional resources
- C5b: Alignment of conceptual content with instructional practices that reflect the reality of the professional market in Communication and Marketing
- C5c: A good pedagogical project in C&M needs to have a dynamic alignment of the contents with the instructional tools from the digital evolution

C6: DPP construct – Differentiated Performance Perspectives. Professional use of the skills learned in educational training has a decisive influence on achieving training objectives and consolidating differentiated performance perspectives. This is the domain of practical behavior explained by the assimilation and incorporation of the contents, practices, and experiences living in the school period driven by the personal motivations and cultural influences of the environment that lead to self-efficacy in overcoming obstacles and achieving life goals: Sheth, (2011); Peter, (1979); Jain, R., & Bagdare, S. (2009); Venkatesh et al. (2003); Luxton, Reid & Mavondo, (2015).

Measurement indicators:

- C6a: Guarantee information, policies, and practices of ethical and moral content contributing to the continuation of the business and building loyal commercial relationships.
- C6b: Emphasis on assimilation, incorporation, and use of computational tools and information systems applied in contemporary C&M.
- C6c: Motivational perspective of development with technological evolution and new tools for understanding the consumer.
- C6d: Attitude of constant search for innovation, renovation, and reinvention in the way of thinking and doing.
- C6e: Knowledge and the pedagogical application of technological resources and decision support systems are essential for the quality and speed of responses and results.

- C6f: To seek understanding and credibility in analyzing trends observed in the networks by consulting experts and discussions on the topic.
- C6g: Recognize details related to the economy and the market in which it operates with references to players, incomers, news, strengths and weaknesses, and potential actions
- C6h: Search for relevant feedback, listen to criticisms, and suggest sensitivity to understand the target audience's statements. (withdraw by sense mitigation generating low Load in constructs where theoretically sense could fit)
- C6i: Self-sufficiency in using technological resources in line with the needs of the job. (Idem previous, also considering the poor formulation of the question.

5.5. Method: Building the framework

5.5.1. Data collection strategy

The constructs described above are latent variables composed of measurement indicators identified by observable behaviors or actions obtained in response to a questionnaire of the Likert type composed of statements extracted from the theoretical framework used in the study and the practice of activities known in the professional communication market. And Marketing and adapted by the authors.

The Sample Profile (Appendix A, p.200) and the questionnaire (Appendix B, p.203) with four answer alternatives - I don't agree, I slightly agree, I agree, and I agree a lot was applied to a sample of 150 students and Ex-students from the Communication and Marketing Management course, at the level of specialization offered by one of the traditional and more well-ranked universities in South America. This sample also includes professionals working in the market in several companies in São Paulo and agencies providing communication and marketing services, many of them Ex-students of the mentioned course, a profile theoretically considered beneficial due to their knowledge of the studied object.

The CEACOM Focus Group intends to use the information contained in the profile of the surveyed sample and the applied questionnaire in projects registered in the conclusions recorded on pages 138/139.

The answers obtained were (76 respondents) distributed by the constructs according to the theoretical model for constructing the framework based on the PLS-SEM methodology,

explaining an alternative idea for identifying an outstanding performance profile in Communication and Marketing Management. It is composed of 6 latent variables, all reflective, according to guidelines seen in (Jarvis, Mackenzie & Podsakoff, 2003), 1 being exogenous (TLO) and 5 endogenous (TICC, CCU, SES, OCI, and DPP).

5.5.2. Hypotheses

The idea, as introduced in figure 22, is represented in the model produced in Smart PLS 3 in figure 23, indicating the tested hypotheses, that is:

- TLO - Teaching-learning organization directly impacts TICC - Teaching integrated cognitive competencies and establishing the best conditions for the production of student learning.
- TLO directly impacts SES, OCI, and CCU areas of student competence.
- TICC directly impacts SES, OCI, CCU, and DPP because of its expected more direct action in the practical result of the teaching action process on the influence of student action in professional practice.
- CCU, SES, and OCI directly impact each other, and in DPP that synthesizes the assimilation of learning and the adoption of knowledge in professional practice, generating as a causal theoretical result normally expected in real situations the perspective of high performance in professional life, represented in the relationships expressed in the project design. This study is also based on the expression of an idea through DSR - design Science research composed of the constructs and their measurement indicators as justified in forming the hypotheses. In this study, the authors only replace the learning contents with those of Communication & Marketing and include, as previously demonstrated, the motivational and self-efficacy aspects developed by Bandura (2008).

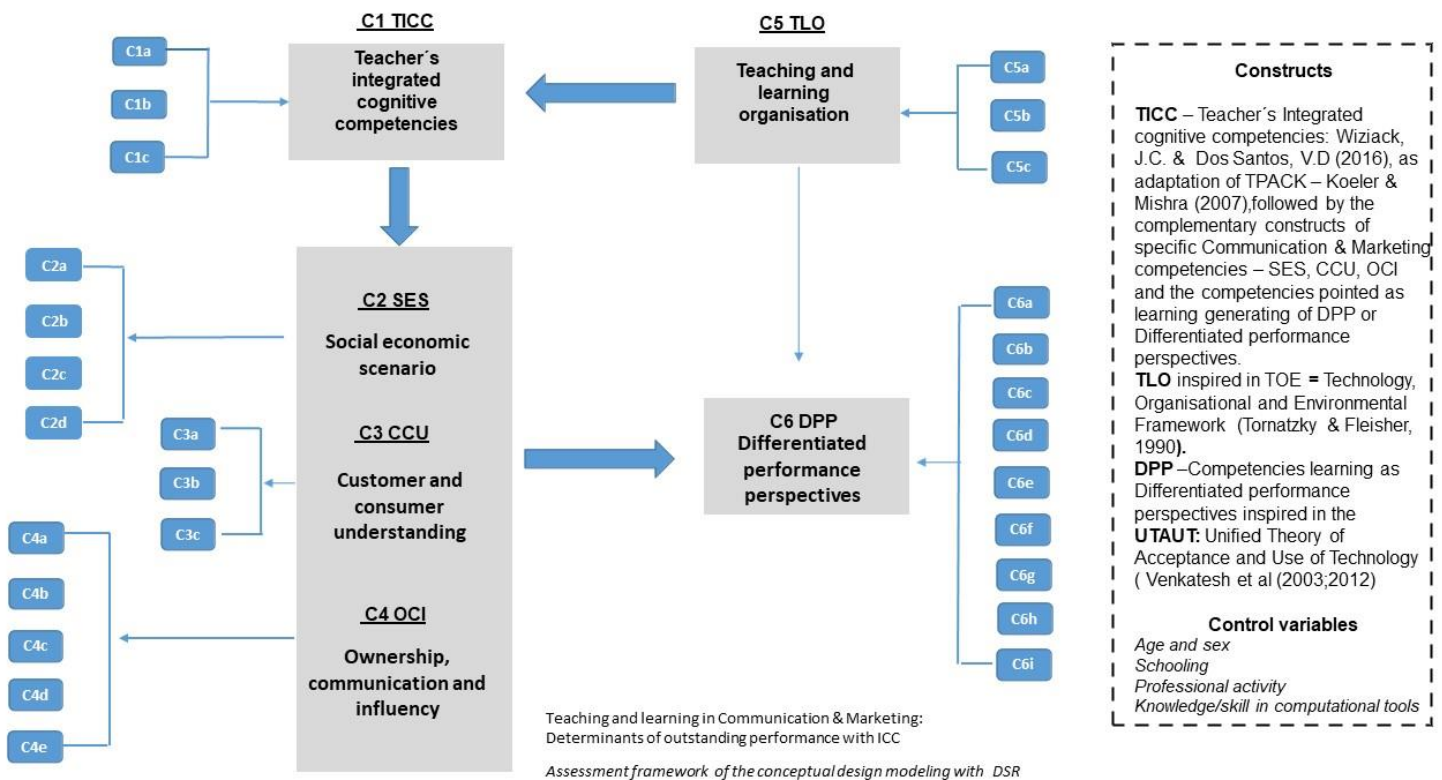


Fig.23.Structural alternative model (artifact) for evaluation of determining Hypotheses of Differentiated performance in Communication & Marketing.

Note: the suggested reading is: C5-TLO impacts C1-TICC: both impact C2-SES, C3-CCU, and C4-OCI. The result is the formation of C6-DPP, a construct representing the expected perspective of differentiated performance.

The design may be evaluated as a DSR application by the Focus Group technique and processed quantitatively by the Smart PLS 3 because there are data for it.

5.6.Evaluation: results and discussions

5.6.1 Measurement model

The theoretical model expressed in figure 22 was initially tested by applying Smart PLS version 3.2.9 (Christian M. Ringle, Sven Wende, Jan-Michael Becker, 2020), according to fig. 23.

This application is justified because it is an estimation model composed of latent variables (not observed) with predictive manifestations (measurement variables) extracted from the applied questionnaires relating certain performances to the respective driving factors.

In the case of the present study, the Organizational Conditions for Teaching and Learning (TLO) associated with the teaching application of Integrated Cognitive Competencies (TICC) result in differentiating competencies made explicit in students' professional practice trained in this context.

Quantitative data were analyzed using structural equation modeling (SEM), with latent variables and hypotheses for statistical calculations being tested using PLS (partial least squares), as justified in the methodological section.

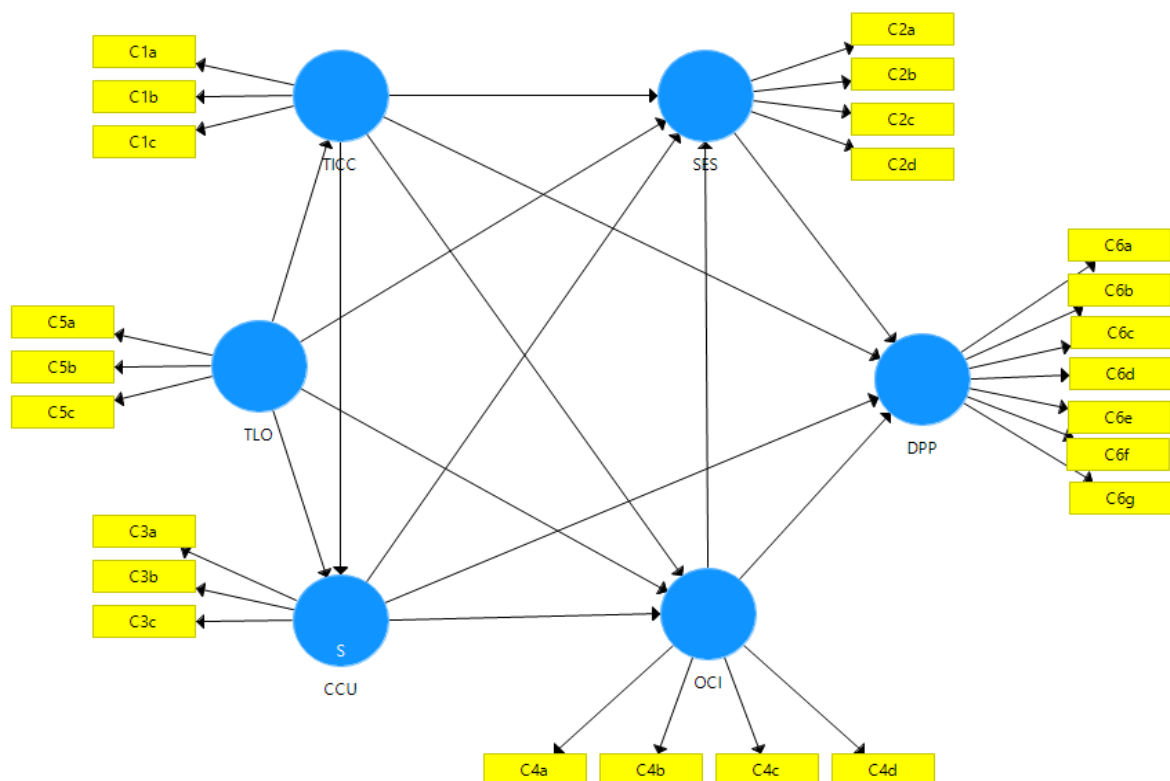


Figure24. Predictor theoretical model for Differentiated Performance in Communication and Marketing.

Note: figure processed by the Smart PLS 3 methodology application.

The measurement model composed of reflective indicators of constructs C1 to C6 is in line with the criteria defined by Jarvis, Mackenzie, & Podsakoff (2003) according to the standard criteria and rules for measuring internal consistency, indicator reliability, convergent

validity, and discriminant validity. The theoretical model projected on Smart PLS 3 is shown in figure 23, and the results are in table 14.

Table 14. Measurement model results

<i>Constructs</i>	<i>Indicators</i>	<i>Loadings</i>	<i>Composite Reliability CR</i>	<i>Cronbach's Alpha (CA)</i>	<i>Average Variance Extracted (AVE)</i>
<i>C1 - Teaching Integrated Cognitive Competencies- TICC</i>	<i>C1a</i>	<i>0.893</i>	<i>0,900</i>	<i>0,833</i>	<i>0.751</i>
	<i>C1b</i>	<i>0.818</i>			
	<i>C1c</i>	<i>0.840</i>			
<i>C2- Social Economic Scenario - SES</i>	<i>C2a</i>	<i>0.877</i>	<i>0,938</i>	<i>0,922</i>	<i>0.683</i>
	<i>C2b</i>	<i>0.767</i>			
	<i>C2c</i>	<i>0.790</i>			
	<i>C2d</i>	<i>0.833</i>			
<i>C3-Consumer and Customer Understanding- CCU</i>	<i>C3a</i>	<i>0.797</i>	<i>0,893</i>	<i>0,842</i>	<i>0.678</i>
	<i>C3b</i>	<i>0.897</i>			
	<i>C3d</i>	<i>0.852</i>			
	<i>C3e</i>	<i>0.857</i>			
<i>C4- Ownership communication and influence- OCI</i>	<i>C4a</i>	<i>0,810</i>	<i>0,893</i>	<i>0.834</i>	<i>0.699</i>
	<i>C4b</i>	<i>0,841</i>			
	<i>C4c</i>	<i>0,785</i>			
	<i>C4e</i>	<i>0.854</i>			
<i>C5-Teaching and Learning Organization- TLO</i>	<i>C5a</i>	<i>0,919</i>	<i>0,887</i>	<i>0.809</i>	<i>0.724</i>
	<i>C5b</i>	<i>0,844</i>			
	<i>C5c</i>	<i>0.763</i>			
<i>C6- Differentiated performance perspectives- DPP</i>	<i>C6a</i>	<i>0.779</i>	<i>0,881</i>	<i>0.797</i>	<i>0.714</i>
	<i>C6b</i>	<i>0.799</i>			
	<i>C6c</i>	<i>0.836</i>			
	<i>C6d</i>	<i>0.872</i>			
	<i>C6e</i>	<i>0.835</i>			
	<i>C6f</i>	<i>0.841</i>			
	<i>C6g</i>	<i>0.846</i>			

Note: Author, according to the Smart PLS3 information data.

The initial model proved to be adequate to the proposed theory obtaining loads of measurement indicators most above 0,7 except for one among the 25 total, which was discarded due to inadequacy in attempts to change to other constructs.

Thus, the convergent validities obtained by the Average Variances Extracted - AVEs, then presented all values above 0.50, according to the criterion of Fornell & Larcker (Henseler et al., 2009), indicating that the model converged to a satisfactory result (Fornell & Larcker, 1981) seen in Ringle, Silva, and Bido, (2014).

Likewise, internal consistency demonstrated intercorrelations of variables and reliability in their set of responses, indicating the level at which the indicators are reflected in the constructs, expressed by Cronbach's Alpha and Composite Reliability values, all also above 0.7. Note in Table 16 below the high score of CR and AC, respectively above the minimums established by Nunnally & Bernstein (1994), with the CR above 0.8 according to Peters (1979).

Finally, the discriminant validity was demonstrated, indicating that the latent variables are independent of each other. That is, each construct presents a greater variation in its indicators than shares with the others.

This means that the theoretical model is solidly explained in the causal relations between TLO - Teaching Learning organization influencing and impacting TICC- Teaching Integrated cognitive competencies, fundamental constructs in the educational process of forming competencies in Communication and Marketing.

The two constructs (C5 and C1) separately mean little in the analyzed context, however together, they define the determining conditions for C1 validation; SES- Social Economic Environment; C3, CCU- Customer and Consumer Understanding and C4- Ownership Communication Influence, constructs that represent the skills learned by the students.

Statistically, the model allows us to conclude that the impact generated in C6- Differentiating Skills Perspectives, that is, that the perspectives of outstanding performance may result from the linked relationships of the set of constructs studied and quantitatively mapped, as shown in Table 16 below.

The independence between the latent variables (Hair; Hult; Ringle; Sarstedt, (2016) appears shown in the Discriminant Validity, both by the criterion of Fornell & Larcker (1981), in the table above, and by Chin (1988), with the level of items (in Appendix C, p.201)).

The existence of high cross loads in Table 17. (Chin 1988) in the Appendix is consistent with the high correlations between the VLs and is justified by the fact that the VLs are processes and behaviors related to the competencies applied in Communication and Marketing in which

a respondent evaluating several constructs at the same time and with very similar statement formats may have been subjected to the bias of the common method (CMB) studied in Mackenzie and Podsakoff, (2012), seen in Bido e Silva,(2019). The measurement model was maintained because of the excellent results of the other indicators, such as CA and CR above the recommended minimum, with CR still above 0.800, according to Nunnally & Bernstein (1944) and Peter (1979), respectively.

Table 15. Correlations and relationships of the constructs studied.

	1	2	3	4	5	6
1. Cust_cons_understanding	0.866					
2. Diff_persp_performance	0.772	0.826				
3. Communication influence	0.439	0.651	0.822			
4. Social Economic Scenario	0.466	0.681	0.817	0.818		
5. Teaching cognitive compet	0,669	0.780	0.734	0.768	0.851	
6. Teaching learning org.	0.799	0.837	0.693	0.743	0.837	0.845
Cronbach's Alpha	0.833	0.922	0.842	0.834	0.809	0.797
Composite Reliability	0.900	0.938	0.893	0.889	0.887	0.881
Average Variance Extracted (AVE)	0.751	0.683	0.676	0.668	0.724	0.714

Note 1: Diagonal values are the square root of AVE, and as they are greater than the correlations between VL(values outside the diagonal), there is discriminant validity.

Note 2: All correlations are significant at 1%

Note 3: Authors based on Smart PLS information

5.6.2. Structural model

To complement the study, with the application of bootstrapping configured for 5,000 resamples and a significance level of 0.05, we evaluated the structural model initially in its original theory of direct impact links between all latent variables with each other and with DPP.

Table 16: Structural model results

Structural Relations	Hypotheses	f ²	Structural Coefficient	Std Dev	T Stat	P Value	Adjusted R ²
OCI>SES	H1a***	0.338	0.454	0.109	4.17	0.000	0.735
CCU>SES	H1b-	0.057	0.207	0.129	1.60	0.100	
TLO>SES	H1c***	0.096	0.373	0.163	2.28	0.002	
TICC>SES	H1d-	0.069	0.262	0.147	1.78	0.074	
CCU>OCI	H2a**	0.093	0.325	0.166	1.95	0.050	0.571
TLO>OCI	H2b***	0.131	0.525	0.150	3.49	0.000	
TICC>OCI	H2c***	0.186	0.506	0.145	3.49	0.000	
CCU>DPP	H3a***	1.050	0.601	0.110	5.44	0.000	0.722
SES>DPP	H3b***	0.443	0.390	0.123	3.16	0.002	
TLO>CCU	H4***	1.767	0.799	0.062	12.87	0.000	0.634
TLO>TICC	H5***	2.348	0.837	0.041	20.25	0.000	0.697

Note 1: Estimated p-values by bootstrapping with 5000 repetitions

Note 2: Higher VIF value = 4.80 variance inflation factor

The model presented three unconfirmed hypotheses. However, the alternative of mediation of correlations of high significance and direct impact of SES> DPP; CCU> DPP, adding the mediation of OCI> SES for the effect of TICC, allowed a structural model of excellent results and explanatory effects in DPP (72%), in addition to all the respective regressions being statistically significant at 1%. Table 5 details the results.

The data in table 5 allow us to conclude that the evaluated structural model explains 72% of the variability of the response data around its mean in DPP, also showing good results in the hypothesis tests (see the combination of f², T Student, and p-values) therefore, validating all structural relations evaluated with an excellent level of significance, except for CCU> SES and TICC> SES. Figure 8 explains the final structural model, whose path is made by the mediating hypotheses.

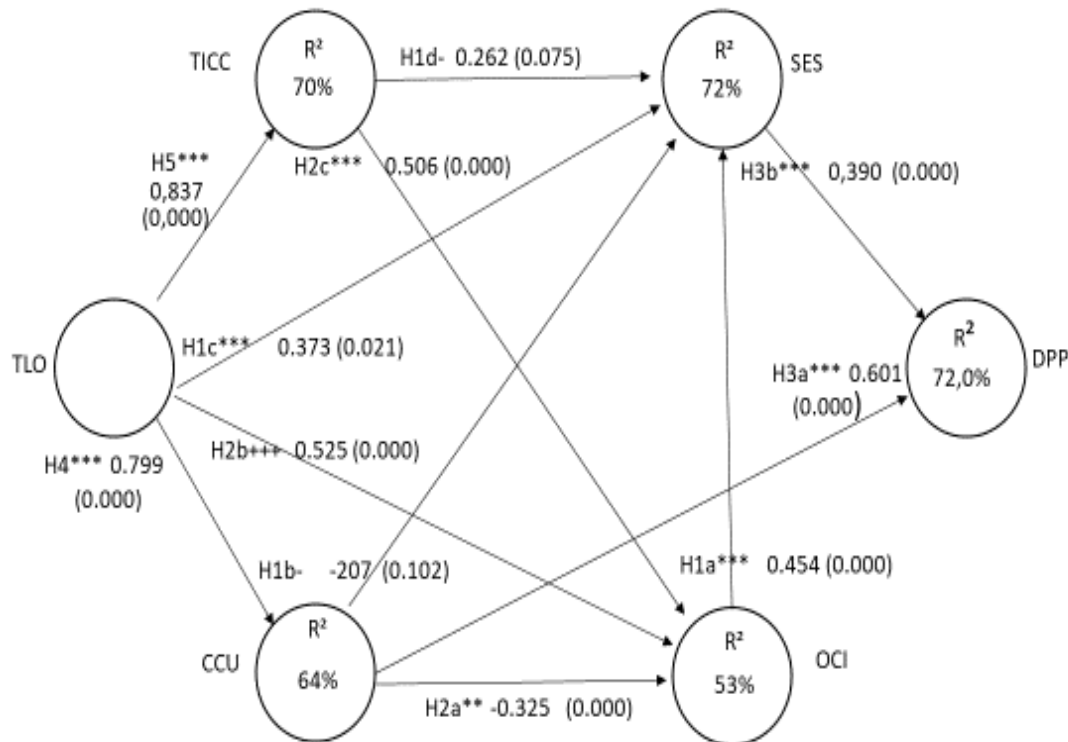


Figure 25. Structural relationship in the final tested model

Thus, the first part of the questions posed in this article is answered quantitatively, indicating that a training cycle of differentiating skills in Communication and Marketing takes place from a program with an appropriate pedagogical project, updated with digital technologies in increasing use in the professional market, applied by teachers with a great command of integrated cognitive skills.

These competencies are concretized in the production of student learning of knowledge, skills, attitudes, and behavior of practical use that generates the perspectives of outstanding professional performance, as predicted in the study's theoretical model.

Although the number of respondents to the questionnaire was acceptable for confirmation through Smart PLS, this study was discussed and qualified through a Focus Group consisting of specialists, professors, and consultants in Communication & Marketing.

5.7. Focus Group Evaluation and comments

In this section, the technique was applied with a Focus Group composed of 12 of the components of CEACOM⁸ - Centre for evaluation and measurement in Communication and Marketing, all teachers, researchers, and consultants, working at the School of Communication and Arts at the University of São Paulo, Brazil as presented in the section of methodological strategies used in the studies for the elaboration of this thesis.

In this study, the Focus Group makes a general qualitative assessment of the results presented and specifically adds observations on views regarding the answers to the research question on:

- a) “In what context could this predictive assessment be confirmed and still add value to the Communication and Marketing professional in the face of the crisis of values and ethical concepts in force today?”
- b) “What trends can be expected to direct relations between the market, consumers, and customers in the period started with the Coronavirus pandemic?”
- c) Are there practical and relevant actions that can be expected from corporate bodies and organizational Communication & Marketing agencies that can influence society through exemplary conduct practices through their persuasive skills, even at the cost of renouncing profit in favor of better social coexistence in the new inhabitant?

In the context of the Coronavirus pandemic, the work process and phases were adapted using online focus group meetings in line with experiences previously carried out, as seen in Abreu, Baldanza, & Gondim (2009); (Hammerschall, (2016).

We carried out Asynchronous and WhatsApp complements with the following agenda:

- Participants received an invitation and explanatory text of the study with objectives and discussion agenda for prior reading one week before receiving the researchers' first contact.
- Participants and researchers met online to work with the following agenda:

⁸ CEACOM - Center for Studies and Assessment in Communication and Marketing of the Communication and Arts School of São Paulo University, Brazil

1. Presentation of the study, objectives, quantitative research, and results. Clarifications and timing schedule for accomplishment.
2. Compilation of participant's responses by researchers
3. Devolution of the answered questions for eventually corrections
4. Videoconference meeting for Focus group appreciation and approval
5. Individual authorizations for publication
6. Incorporation to the text in the discussions and/or conclusions sections

The result of this mapping of Differentiating and determining competencies for success in the current market scenario in Communication & Marketing was qualified and endorsed by the Focus Group composed of 12 Ph.D. teachers and researchers belonging to CEACOM (general data attached). They also participate in students' training and educational process in the Communication Management and Marketing course specialization at the School of Communication and Arts of the University of São Paulo. The main observations, complementary comments, and conclusions are as follows:

- a) *“In what context could this predictive assessment be confirmed and still add value to the Communication and Marketing professional in the face of the crisis of values and ethical concepts in force today?”*

Initially, we must put this issue in a context where the Communication and Marketing professional must always be updated, as a requirement of the market and the academic world. Adjusting to this profile is important to focus not only on yourself and your surroundings but also on reflecting, from a universal point of view, what influences, what tools, and how people are relating, growing, and producing with others.

Predictive performance assessments allow us to understand the ever-faster social dynamics that influence the process of building scenarios in the short, medium, and long term. After all, in the context of organizations, the possibility of anticipating the reading of the environments to which social movements carry us is increasingly important.

The domain of behaviors and practices that generate differentiated performance – seems to be broad enough to contemplate the various determining factors for the results of the teaching-learning activity. In addition, constructs that can help teaching institutions, course

coordinators, and teachers perform their functions more assertively exert a very relevant influence on the pedagogical program of teaching programs.

We recommend explaining some fundamental concepts for full performance in this profile, especially in strategic positions. In this sense, we reinforce the need for updating and a robust theoretical presence in differentiated performance profiles with: a solid mastery of communication theories and theories on consumer behavior; market segmentation studies; brand and product management; concepts of pricing and distribution, as well as mastery of schools and marketing systems. These competencies must be integrated into a broader vision, relating them to behavioral, economic, political, and social sciences. It is up to the teachers, in a transversal way, to broaden this vision between the frontier areas.

The importance of assimilating theory in learning was also emphasized as a first step. Understanding that this theory was modelled through practice and had a reason to exist facilitates the understanding and analysing of problem situations in daily professional practice. One issue, however, is that practices are changing. For a long time, the relationships between market players, in general, have become fundamental as a business strategy. If the focus was pre-sales at the beginning of the marketing process, today, the after-sales are actively developed naturally by companies. Mainly those that have their greatest reputation in the brand. In the digital world, the trend is for this relationship to be ever closer and more effective. After all, at what other time did companies get to know their customers so well, and vice versa? Information is not lacking, just knowing how to use it.

There is, however, a major central concern with contemporary marketing that accompanies the current context in major transformations: are we taking correct actions to understand the companies' customers or consumers? Are companies really striving to develop their customers' needs by understanding their customers' problems? Are companies developing products and services focused on their customers' needs and wants? Are we teaching how to conduct in-depth consumer studies? Are we using the right information, techniques, and tools?

In this context, the Focus Group highlights the importance of attention and focus for understanding relationships with others, empathy, and collective constructions as various signs of modernity. It is about doing with and not just for; that is, the person who receives the product also participates or interferes in its construction. Companies would be prepared to build relationships together with all stakeholders.

- b) On trends that can be expected to direct relations between the market, consumers, and customers in the period started with the Coronavirus pandemic.*

Thinkers like Kotler (who analyses this relationship and now talks about Marketing 5.0, going through 2.0, 3.0, and 4.0) follow the evolution of society and how quickly and dynamically these relationships change. When a company is thinking about a certain type of action, suddenly, this action is no longer the best to reach a certain audience. The market is constantly changing, but we believe it changes because the consumer changes, becoming more demanding and participative; he feels he has more voice, in other words, more heard.

The Covid-19 pandemic, with its prescriptions and effects, anticipated several practices and processes of organizations, as well as behaviors and attitudes of individuals, professionals, and consumers. Remote work has been gaining ground in many activities where the professional's presence is not essential. In the case of marketing and communication professionals working in companies, they are usually not. Of course, face-to-face meetings will always be important but probably much less frequent. With that, the aspects of the choice of the place of residence of the families must change completely, and more pleasant areas that can offer a better quality of life tend to be more inhabited, fleeing from the big cities.

At first, this decision seems to cover only the most economically favoured families. Those with lower purchasing power should also follow this movement, given that the cost of living in inner cities tends to be lower. These transformations will generate several other changes in production, logistics, distribution of goods and services, and consumption. Obviously, technological advances will be essential for these changes in companies and people's daily lives. Issues related to the environment, social demands, and diversity also tend to be increasingly considered by citizens and organizations given already constituted values in decisions of favourability market analysis. In addition, we live in a contemporaneity that we can call liquid (Bauman). A social reorganization starts from, and, in digital social networks, it allowed massive changes in essential social values with influences and the ability to disperse stories, including brands. The moment seems to bring up the consumption of ephemeral things by compensating the disillusionment feeling, very similar to the concept of learned behavior, as disbeliefs regarding expectations for change, the brevity of life, and other feelings also born with the despondency and difficulties brought about by the Coronavirus Pandemic.

There is a quest to live with more joy and quality. The tendency is to obtain the immediate benefit of consumption as a form of positive experience. It is necessary to understand the consumer within the general context of changing social, economic, and political life and thus analyse the longevity and effectiveness of consumer experience concepts and concept stores, sensory marketing, technological innovations involving the back office and front office relationship, and other tools in use.

The future, which is today, is more consistent in consumer studies when using scientific constructs based on "Data Science": internet of things, artificial intelligence, "big data," learning machines, "data mining marketing," etc. . Changes in consumer behavior are gaining a dimension that if not understood, taught and developed will destroy established brands, products, and services. Can you explain why? This ignorance potentially kills brands as long as inconsistent and even false narratives created around brand images or characters cause the slightest loss of credibility.

Still, in terms of teaching and learning, it is observed that the new times call for more agility in decision-making. Therefore, the market has been looking for more fulfilling people with more drive, typical of younger people. Learning more focused on practices mixed with the conceptual part through lectures, chats that demystify more complex issues, presenting theoretical models in a simplified way, and showing what the theory is for, where it comes from and how it was built. As an example, we can talk about a turbo swot, an excellent practical tool, and the market attractiveness analysis models that are well applied to show the student that the origin of any business that wants to be successful in the market is to find an opportunity that comes from a problem or to have a strength or competence that, when joining the two, can offer solutions. Thus, well-applied and understood instruments such as this one can minimize uncertainty and maximize the possibility of finding solutions to problems, increasing the level of assertiveness.

- c) On the role of professionals and organizations in contributing to forming an ethical and sustainable profile for a new planetary future considering the persuasive potential of Communication & Marketing in the business environment.*

Educational institutions dedicated to `Communication & Marketing must have a subject in their course schedule that addresses issues of ethics, corporate governance, compliance, diversity, and sustainability, among others. However, it is essential that these issues are dealt

with transversally; that is, all teaching staff in all disciplines can discuss these professional conducts with students. The guidelines for an ethical practice have already been launched; maybe they need to be adjusted given so many behavioral changes and observed trends. A quick internet search identifies the Codes of Ethics of Marketing Professionals and organizations worldwide. What is wanted is that they are complied with and, if not, that professionals are held accountable and suffer appropriate reprimands by bodies in the area itself, such as regional class councils, self-regulatory councils, as well as other legal entities.

The Communication & Marketing process, through actions led by its professionals and educators, has a great potential to transform the quality of social interaction through persuasion for good and ethics in advertising choices, even if this may cost eventual waivers of profits. We cannot forget that a lie, even a small one, is irretrievable for the values of brands and companies. You can lose some of your popularity, but losing your credit is terrible. Communication & Marketing professionals are increasingly taking on the role of “trustees” of content developed in different environments, especially on digital social networks. Therefore, they no longer have a role as just "content developers." This makes the responsibility for emphasizing one type of message or another important in the political environment (regardless of party politics). So, issues related to ethics and accountability for sustainability must be present in the choices of *professional-trustees*

In fact, companies already relate their brands to institutional actions that propagate ethics and sustainability. The important thing is that these actions are not a simple marketing strategy and that the communication of these actions is also aligned with these principles. This is a good and smart attitude because consumers are now much more aware of their values as a person, making this reciprocal behavior healthier for the business and sustainable for both and the planet's sustainability. With their power of persuasion, the Communication & Marketing professional has a great responsibility to treat the consumer as a person in a holistic way.

Another relevant aspect is the emergence of digital influencers who influence behavior and purchase decisions with their content and lifestyles. The big issue is that, by becoming a way of professional performance, they constitute content producers, who do not necessarily follow pre-established criteria by professional councils, and under the stigma of spontaneous, direct, uncommitted communication of brands or values, can induce the adoption of sometimes socially questionable ideas and behaviors. It is not about considering followers as devoid of criticism or criteria, but that digital

platforms and social networks have the power and practice of omnipresence on any mobile devices and any time of day or night, repeating messages and suggestions that capture attention memory.

Technological transformation and instantaneity are affecting people who become more demanding. Companies have to generate even more connections so that people receive more benefits. This makes people more connected and collaborative, generating new needs and ways of doing business. Complexity then demands more complexities. This all shows the importance of technology and new tools and must be shown to students in their various interactions with Communication & Marketing more dynamically and practically in their daily lives. Data science - data-driven marketing is another example that, if properly understood, can provide better customer service and the marketing intelligence that needs to account for dynamics and movements to deliver value to a society based on its current and possibilities for building future solutions as well.

It is crucial to include subjects with practical content in these courses in general and pedagogically well conducted. The difference between teaching classes is noticeable only with theoretical/conceptual discourse and classes where theory and practice are mixed. The involvement of students with the discipline and with the teacher himself is clearly more interesting in the second case.

As a learning and practical result of this qualitative assessment, the Focus Group presented the following *additional suggestions*:

- Define a working group with three evaluator researchers to develop a *Brand Persona* project for CEACOM for internal and external use in the interface with the contact audiences.
- Review the skills and issues raised and addressed, as well as examples mentioned in this qualitative assessment given possible adaptations in actions and Pedagogical Program of the specialization course in Communication & Marketing, as in other programs coordinated by CEACOM within the scope of the School of Communication and Arts at the University of São Paulo.
- Rethink possible actions related to Ethical Education and Relationships (close and distant), considering the applied questionnaire and students' profiles.

6. Conclusions

Both the client/company and the final consumer are part of this lively round of transformations, always attentive to social changes, cultural requirements, and the search for transparent policies. For example, society seeks to seek information to avoid greenwashing, as the consumer no longer wants to be deceived and goes after the information. In fact, this false attempt to engage the brand's image or the organization has been widespread. The Communication & Marketing community should directly reject it as the voice of this article.

The relationships between the market, consumers, and customers are moving to a new level where there will be much more transparency in the sales, exchange, and negotiation relationships as a result of greater use of the countless data that are available to everyone, from the technological and computerized world increasingly developed. Data will be more critical and valuable than physical assets. However, it will be up to organizations and their managers to transform data into information. The most important thing will be disseminating and communicating data and information with employees.

Unfortunately, the idea remains that the Communication and Marketing professional is restricted to being the “marketer” or the one who will develop strategies to increase sales or make the brand better known. On the other hand, fortunately, some companies can see and position the Communication and Marketing professional as of paramount importance, not simply the one who will help increase sales, but the one who should be part of the Strategic Planning of the entire company. This professional must have a broad vision and participate in the decisions of the whole process and chain of the product/service, from the acquisition of raw materials to the final product, playing a much more strategic role as an integrator and team leader.

From this perspective, the Focus Group reinforces the importance that should be attributed to the ethical training of this professional. Indeed, good specialists in the technical field, who dominate the various resources and increasingly innovative tools on the market, are needed. However, it is essential to educate world citizens concerned about the here/now and the planet's future. In the training environments of future professionals - as is the case of the university represented by these Focus Group researchers - there is great concern with the numerous influences acting on the profile of students as bloggers of all kinds, influencers who expose themselves in all ways, either aggressively, sensually, politically, scientifically, etc.

A negative chapter happened, affecting Cambridge University about combining digital platforms and social networks with the methods in psychometry research. It refers to a behaviorist bias used in psychological profiles to predict behavior from a Big Five⁹ psychological classification. Cambridge Analytica, a different agency out of university, used part of this research developed for the complementary use of anthropological analysis negatively in the context of public and political communication. This exemplary case reveals how the capture and manipulation of data were not authorized by people, as the actions taken on social networks established influence criteria and changes in opinions and behaviors.

This myriad of people and ideas often brings no solution but confusion and suffering. We all have an obligation to seek to update as students, teachers, and professionals. Still, we also have to seek spaces to reflect, question, and welcome doubts and feelings of this professional in training or face serious misgivings in the professional environment. Ethics sometimes sounds “false” or utopian in a country without a shortage of examples of corruption and impunity. Even so, we believe that it is our duty as professors and professionals in the field to open spaces to discuss, talk, and seek solutions with students and professionals, projecting ethical postures and a profile of competencies consistent and coherent with the aspirations of a new planetary habitation.

In this sense, this article worked on a proposal discussing the results of a reflective investigation aimed at students, professors, and professionals in Communication Management and Marketing, striving to know their opinions and perspectives regarding the formation and professional profile of high performance aligned with technological innovations and routine disruptive events in contemporary life. These conclusions showed that the teaching and learning of new skills that adjust to the speed of the new planetary habitation must remain economically and ethically sustainable, in line with social humanization.

We consider that the relevance of the contribution of this article to academics and educators in Communication & Marketing is due to the exposition and discussion of the causal relationships examined between the organizational conditions of Teaching and Learning, directly influencing the Integrated Cognitive Competencies mobilized by the faculty in the

⁹ Big Five: 5 personality traits; 1) openness to experience; 2) Conscientiousness; 3) Extraversion; 4) Neuroticism or Emotional Instability and 5) Kindness

formation of professional competences of students. The effects will undoubtedly result in behaviors and practices that potentially generate differentiated performance if applied in professional life.

As noted, the first measurement indicator of the PPD Construct – Differentiated Performance Perspectives clearly points out that “guaranteeing political information and practices of ethical and moral content contribute to the perpetuity of the business and build loyal commercial relationships.” The analysis and opinions expressed by the Focus Group validate and reinforce this reflection.

Communication & Marketing currently assume a strategic and management role, co-responsible for the success or failure of the actions of organizations. Professionals in these areas are great observers of daily life and have a vision of the future. In addition, they must anticipate the trends that present themselves and literally think about the survival of the Earth and Humanity.

We can no longer think about the short-term and easy profits. It is now time to work with “new” concepts, where we must value ethics, sustainability, and human appreciation.

This new role cannot be charged only to these professionals but also and above all to them, as Communication and Marketing will increasingly strengthen consumer relations and, as we all know, there will be a growing demand for conscious consumption by all humans

Chapter 6: A Good Project for Brazil: Integrated Cognitive Competencies and Critical Pedagogy on the Move to the Future¹⁰

Contemporary society has been surprised by the speed and constant innovation of technological artefacts creating a new culture based on cognitive development leveraged by the availability of infrastructure and technological innovation in the blink of an eye. This session suggests reflections on the Brazilian contemporary educational pedagogical process, evaluating adjustments to the speed of learning with cultural changes in the Information Society era, and presents an alternative of thinking based on the development of integrated cognitive competencies under the effects of a transformative pedagogy for incorporation of digital technology in educational processes.

The methodology applied could not be other than a reflective process firmly centered on Critical Pedagogy Freire (1996, 1972, 2003, 2011), Giroux (1994, 1999), and Saviani (2005, 2006, 2007) discussed in the light of questions that seek to answer how society thinks to walk in its humanization process based on this new reality deeply affected by the Coronavirus Pandemic 19 associated to the political environment. The proposed pedagogical result is evaluated through alternatives and ways of thinking produced by the DSR - design science research supported by the Focus Group technique, composed of specialist educators and researchers from two of the highest-ranked public universities in Brazil, supporting the qualitative research discussion

The study supported by a comprehensive bibliography shows that cognitive development is built through the formation of new competencies, integrated and absolutely subordinate to the context of humanization values of a sustainable planetary society. However, the analysis is set in the Brazilian reality compared with broader landscapes and universalizing pedagogical thoughts. The studies then converge to the formulation of the proposal of ICC – Integrated Cognitive Competencies and Transforming Pedagogy to incorporate digital technology in educational processes in an effective, planned and managed way in the context of the PNE-National Education Plan.

¹⁰ Article under revision and produced as a commitment established at the time of planning the thesis project.

From the perspective of a critical reflection, the study, in our view, becomes a contribution to the renewal of the educational process that imposes itself as necessary for new forms of global coexistence, not only due to the current model affected by profound technological innovations but mainly because of the need to know what can or should be done with this knowledge capital to benefit the Peace and Good of humanity.

Keywords: Integrated cognitive competencies; Transformative Pedagogy; Self-efficacy; Institutional complexity; Teaching-learning; Critical pedagogy.

6.1. Introduction

Finally, it is time to think about a good project for Brazilian education, democratic and in line with a critical pedagogy that becomes adequate to meet the humanist aspirations gathered and chosen due to the dialogue established within Brazilian society.

The central theme of this thesis is ICC – Integrated Cognitive Competencies and transforming Pedagogy for the incorporation of digital technology in educational processes, whose pedagogical application model was conceived having as its horizon large-scale teaching and learning systems. Certainly, this thesis was conceived to be applicable, relying on the Brazilian environment as a reference case due to factors of the location of studies and research and the country's backward state in the world comparisons of PISA.

The methodology applied for the recognition and approval of the model was the DSR - design science research evaluated by three focus groups composed of specialists working in comprehensive educational processes as a means of mobilizing the discussion of ideas with professionals who truly master the knowledge of the educational environment and their day-to-day difficulties.

However, according to the DSR methodology, the process is not finished without being put to the test through practical applications. Thus, according to the proposal presented in the qualification section of this thesis, the last step would be that the conclusions of the study would still allow the production of an article aimed at influencing the formulation of public policies within the scope of Brazilian Education for inclusion in the next PNE – National Education Program.

In this sense, then follows the proposal containing the reading of the country's political, pedagogical scenario with the government's profile and actions started in 2019, some of which

are recorded in the sessions below. The rationale for the title of this final chapter is a snapshot of the current situation. Even with this climate of pain, we will present this proposal regretting only that shameful and humiliating facts have to be part of this narrative at the end of a challenging but fulfilling study moment. Our goal is to read the scenario and contribute with a proposition that can, at the very least, arouse the awareness and talents of other potential contributors in the set of our society concerned and anxious to see Brazilian education being designed and rebuilt with compelling perspectives.

It is essential to be clear that our description of the political scenario of Brazil exempts itself from any evaluative comment on the Bolsonaro government. The main objective of the following proposition is independent of the political situation that Brazil is experiencing at the moment. We will briefly enunciate the scenario experienced so that readers can identify some difficulties that will be faced in carrying out this educational project affecting the timeline and results.

6.2. A scenario of anguish and uncertainties

Brazil today is a country without projects. There is a climate of negation. Even forest burnings and lying are naturalized as routine matters. The whole world already knows what is happening in Brazil. The recent opening of the UN - United Nations meeting was didactic. With this climate of pain, we will present this proposal regretting that humiliating facts must be part of this narrative at the end of a challenging but fulfilling study moment.

I believe relevant facts in the Brazilian scenario are supported by sources in the major press and social networks. Even so, we cannot always guarantee complete veracity, with fake news as part of our communicative coexistence for two years now. They cannot even be classified as “noise,” as was previously used in Communications theory. Today they need to be analyzed and interpreted in the general context. Each day comes to a different fact, taking the focus away from our real concerns about the future and intensifying divisions and controversies among the population.

However, what comes from social networks cannot be left out due to the impact and effect on the conception of the communicative pedagogy of the moment, whose ecology still constitutes a field that is not fully established and regulated, even in a global scope. It is the moment foreseen by Negroponte almost 25 years ago. This session sounds almost like a call

for helping a lived reality that needs a non-politically polarized solution, but one that objectively reviews and chooses the best path for democratic education.

The fact is that the Brazilian population is currently living strange uneasiness, fear, and social division. WhatsApp groups and other social networks are categorized as left (or communist) and right (right, and fascist). Undoubtedly, the expression of hatred that has taken over the political discussion in the country can be found. Masks fell, the people's convictions were revealed, side-choices made and defended at any cost, democracy and respect crumbled, and disappointments tore families apart, strained relationships or cut them off altogether.

Belonging to the right today, as shown by the neo-Olavist¹¹ radical and muddled, it means to demonstrate a speciesist¹² behavior typical of the man of past centuries, ancient humans reborn and who today consider themselves different, belonging to a species with exclusive rights, prevalent over the world in which they live, and that, therefore, it is very natural to consider the other species (where I have to include the leftists, also known solely as communists), as inferior in every aspect of citizenship and coexistence.

In short, this style and way of acting have become like a formant form (Maffesoli 1996) of a pedagogy that only they wanted for society, with the aggravation of not being built democratically but by a family group, a pseudo-philosopher, and a few passive listening supporters and a group of militaries with dubious history career. With lies, false promises, and an army of robots, they gained power with just over half of the valid votes.

In a comprehensive study considering the period from 2006 to 2017, Vosoughi et al. (2018) pointed out that 126,000 stories were verified on Twitter involving 3 million people, more than 4.5 million times. Six independent fact-checking organizations displayed 95-98% of this information categorized as politics, terrorism, natural disasters, science, urban legends, and financial information. False political news had greater effects than those on terrorism and the other categories mentioned, including financial news that has a potential for data distortion,

¹¹ Followers of Olavo de Carvalho, former journalist, representative of conservatism in Brazil, digital influencer, self-proclaimed philosopher and who has lived in the United States since 2005. He is recognized as an advisor to the ideological group that advises the President of the Republic.

¹² Term that I borrow from Agnes Trzak in her book *Teaching Liberation: Essays on Social Justice, animals, Veganism, and Education* where we see how ourselves not being constructed as human-enough (as favored, represented, and powerfully) we can also suffer from speciesism.

causing immense damage in certain situations. The study presents a deep statistical analysis and anticipates some conclusions:

- Fake news was more innovative than the real news, suggesting more attractiveness for sharing
- False news causes the greatest impact in terms of inspiring fear, disgust, and surprise in sharing responses
- Robots spread the false and true in the same proportion, with the same propagation acceleration, which demonstrates the greater speed of dissemination of false being attributed to the behavior and action of humans and not robots
- Checks made confirm that true information is deeper than presented online

Although investigations are always more focused on the technological issue of Bots, the study concludes that human behavior is the biggest accelerator of the spread of lies and that, therefore, it should be better understood and attacked with actions for possible cures (Vosoughi et al. (2018). We can observe by using the term in diagnosis that this human distortion is really one of the diseases that plague contemporary coexistence and the very relationship of man with his technological actants. “What is fake news, except intellectual confinement? That is: you believe in something that many times has neither head nor tail – but you believe in it and separate yourself from the truth” (Yves de La Taille, 2021)

Again Negroponte, in his book *Being digital*, foresaw 25 years ago that “we would face digital vandalism, software piracy, and data theft” (1995). Unfortunately, despite being an optimist by nature, he also foresaw the “radical transformation of the nature of our labor markets” (p.215) due to online work done globally.

Finally, there is so much nonsense and misunderstanding that a CPI - Parliamentary Inquiry Commission is in progress, focusing primarily on the irresponsibility committed to conducting the Coronavirus pandemic and the dissemination of fake news.

It seems that we are living the first part (Hell) of the Divine Comedy (Dante Alighieri) but always wishing that our passage to the second (Purgatory) and third (Paradise) may happen at some point. We believe in the victory of democracy, but we fear, however, for Education and the attempts to impose a radical right-wing cultural

6.3. In Education, the pedagogy of evil

Focusing only on Education, there are several points to regret, starting with the wrong choice of its two Ministers, followers of Olavo de Carvalho. The first was a Colombian citizen named Ricardo Vélez Rodríguez, nationalized Brazilian with a vast academic career in Brazil, where he studied for a master's and doctoral degree. His lack of experience and management skills allowed him only three months and ten days as head of the Ministry of Education.

A lot of nonsense for such a short time and no project for Brazilian education. Velez's successor was Abraham Weintraub, who, according to Rosangela Bittar (2019), editor of the *Valor Econômico* newspaper, was the worst minister Brazil has had since the military government of João Baptista Figueiredo. He is described as “thicker, more erratic and emptier” than the previous minister. See in this link an obvious example of this rudeness unworthy of a Minister of Education.

Bittar has 41 years of a career dedicated to politics and education and believes that “Education today is a pity. There are only losses”. There is nothing to expect from this minister because even his career does not recommend him to a ministry of this magnitude. Furthermore, its irresponsibility to say without proof that public universities are home to large extensions of marijuana cultivation and laboratories for the production of synthetic drugs should be charged by the Attorney General's Office and investigated by the Federal Police. See the following link: <https://www.youtube.com/watch?v=Ah95ofO149g>

What about the third minister occupying the position at this time? He is as meagre in his actions as the others. The only advantage is that he works in silence. One does not know what he does, or he does not do anything. I do not remember his name and do not even have scandalous news to record. It is known that there was a major dismantling in the structure with departures and displacements of important staff, which gave stability to the management of the MEC. In addition, the great spectre of budget cuts for various programs is around, and the studies carried out for privatization are unknown.

From the observation that the MEC lacks a competent and reliable command, we return to the context of our main objective, which is the reflective proposition on the need to seek a good project for Brazil in Education through the democratic paths offered by the Federal Constitution. We are talking about the PNE - National Education Plan, in force and approved by Law No. 13,005 of June 25, 2014, already in the phase of revisions in its goals to be met by

2024. This is an available constitutional path, as expressed in (PNE (2014, p.9). The solution to this uncomfortable and chaotic situation for Brazilian Education comes precisely from the ministerial Cabinet itself; I mean that, whether we like it or not, the solution will pass through there.

6.4. The PNE and its Political Pedagogy

The apparent profile of the political figures shown in this introduction is obviously intended to communicate that the pedagogy applied to an educational system has everything to do with what society defines it and not with an elected individual, no matter how many votes he has. Robots spread false information about education and Brazilian universities through social networks. No constructive ideas were presented, just criticism and insults.

One of the greatest advocates of Critical Pedagogy, Henry Giroux, has advocated that it is necessary since entering the new millennium to “make new connections, assume new paradigms and open different spaces with new allies to work simultaneously towards changing schools and the social order broader” (Giroux, 1999, p. 12). The author refuses to limit his concern with the concept of Pedagogy as a way of transmitting knowledge and skills but rather as a profound political and cultural participation in the construction of knowledge, subjectivities, and social relations, which include the very review of the meaning of pedagogy in “processes by which people understand each other and how they engage with other people and the environment” (p,15)

Giroux 1999) also emphasizes, and amazes, for many years, the need to “construct a new type of politics, language, and subject” (p. 49), precisely the issue that in our time constitutes an obstacle to the articulation of differences that constitute pedagogical concerns that do not achieve great mobilizations and democratic reflections.

Giroux's radical pedagogy is critical and goes at the root of making society more democratic, always reviewing institutions and their assumptions, following and bringing together social theory and practice. This is only possible with the critical mobilization for questioning the assumptions and maintaining the direction focused on the education of citizens. (Giroux, 1999).

The author also presents us with a critical thought and reflection for our time: the teaching role in Frontier Pedagogy placing education professionals and managers at the interface between School, State, and students working to understand the limits, actions, and

values for the formulation of the pedagogy of the present and still transposing these limits by critically listening to students' voices and legitimizing differences, thus overcoming their own knowledge limits. This will take us forward in discussions about new teaching skills for Teaching and Learning, or, as it has been coined in previous works, for further educational action.

Like Giroux, we see the contributions of Saviani (2006), who reminds us of two aspects to be placed as a preamble to this reflection on Critical Pedagogy: the National Congress has played a role, since the transition from the Military to the Democratic Regime, of “important instrument for maintaining power in the hands of traditionally dominant groups”(p.13). It is difficult to doubt this assertion when we see, in a situation of such disruption, how the PT government fell to a right-wing with promises to end corruption to approve the pension reform with the same strategy as the old bargaining policy—on the other hand, allowing the continuation of the excess of financial benefits and unnecessary benefits with the political and judiciary class confronting our capacity for understanding and impotence to solve the problem democratically. The second point that Saviani points out is the "productivism conception of education" already demonstrated by statements by former Minister Weintraub and thus extolling the "theory of human capital." This minister thought that it was better for us to train electricians, mechanical turners, and carpenters, who, according to him, are more likely to find jobs.

Saviani (2008) also goes beyond the pedagogies of essence and existence by highlighting that the “revolutionary character of the pedagogy of essence focuses on the essential equality between men” (p.51). He adds, however, that this character is historical and changes over time but implies that the contractual pressure coming with the bourgeois revolution is transformed into real equality. Critical pedagogy must articulate with the forces present in society, representative of the greater common good, and in this way, seek the means of transforming the social reality, including the relations of production.

Like Giroux, Saviani also places importance on the political awareness of the teacher, whose contribution will be “the more effective, the more the teacher can understand the links of their practice with global social practice” (Saviani, 2008, p.64). In the important mission of mediating the humanization process, one more opportunity to highlight the need to review and develop new teaching competencies for new educational action in the environment of the new inhabit.

Paulo Freire expands this political vision of pedagogy and, simultaneously, focuses his methodology on the criticism of the various social contexts studied throughout his life as a researcher and educational scholar. In the study for the construction of this thesis, although named CCI - Integrated Cognitive Competences and Transformative Pedagogy for the incorporation of digital technology in educational processes, methodologically, it was always thought with the transformative Pedagogy ahead. In the order of things, what is sought as the central objective is to instrumentalize transformative critical pedagogy in the sense that it is supported by technology and by the new competencies expressed in ICC.

When justifying Transformative Pedagogy as a critical reflection in another section of this thesis, we mentioned the holographic view (Morin) of an intentional model acting on the cultural elements that need to be assimilated by individuals for them to become human (Saviani, 2008, p. 422). It is interesting to note that we are using technology to help us in our humanization process. At the same time, just now, we have seen the human direction for technological help in spreading false news.

Just as we can train robots to perform evil, we can also teach them to help us perform well. This means that just as it was before and that will continue to persist into the future, pedagogy will be the formatting of concepts, ideas, and instruments that will best answer the question about what kind of humanity we want to build and, therefore, what education we need a plan for the kind of citizens we want to be. (Saviani, 2008; Giroux, 1999 and Freire, 2011).

The 1988 Constitution did not create or update what the alternating history of periods of inexperience in the full and lasting exercise of democracy did not advance in the achievement of true humanization and liberation for autonomy (Cabral 2016), reminiscent of Freire stating that “Brazil was born and grew within conditions negative to the democratic experience” (Freire, 2011, p.90).

The pedagogy present in the history of the PNE has been marked by the reproduction of the passive status quo and linked to increasing numbers and statistics that are not translated into quality results in Teaching and Learning. It is enough to look at PISA evaluations since its beginning in 2000 and see the meagre results attributed to Brazilian education.

Next, the PNE will be addressed in its current conception for the 2014-2024 decade, the current stage of the established goals, and almost no achievements. Then, the concepts

related to the CCI and its important applicability in the transforming pedagogy of Brazilian education will be resumed as a fundamental element for accelerating results and minimizing the delay in which Brazil finds itself concerning the real needs. Finally, the conclusions, comments, and contribution suggestions obtained from the Focus Groups participating in the critical evaluation in this study are presented.

6.5. The PNE 2014 – 2024 in its conception and current status

The current PNE - National Education Plan for the 2014-2024 decade, was approved on June 25, 2014, under the management of President Dilma Rousseff and configured in Law No. 13.005/2014

Any attempt to assess its results so far is regrettable and counterproductive in all respects. However, it is necessary to record some points to explore new proposals, as well as hoping that even this government still manages to implement more effective actions to comply with the other goals:

1. This edition of the PNE should correspond to the period from 2011 to 2020. However, it spent four years for final approval in Congress. The previous Plan had already suffered a delay of 3 years. Although both mobilized significant democratic participation of the civil community, the poor management of discussions and procedures was evident, given the magnitude of the organized representation system to work in the plan. The point to be regretted is that a constitutional commitment of this importance is fulfilled inefficiently and without rigor in fulfilling deadlines and responsibilities given the planned results and transformed into law. Are there prospects for making the PNE an effective action instrument for educational management?

The linking of PNE Investment to a percentage of GDP was much discussed and finally agreed as being 10% at the end of the period, that is, 2024. Goal 20: “Increase public investment in public education to reach, at least, the level of 7% (seven percent) of the Gross Domestic Product - GDP of the Country in the 5th (fifth) year of validity of this Law and, at least, the equivalent of 10% (ten percent) of the GDP at the end of the decade. The goal will not be reached and is already on the radar for changes. The goal was very optimistic within the perspectives regarding the pre-salt exploration and the lack of awareness about the reality of the resources diverted by structural corruption in our country. See the position of the Minister of Education in:

<http://agenciabrasil.ebc.com.br/educacao/noticia/2019-07/mec-quer-alterar-meta-de-investimento-de-10-do-pib>

2. There is no specific goal among the 20 that considers a strategic pedagogical action that invests in the modernization and adoption of digital technology in teaching and learning processes and the computational tools and database systems and artificial intelligence already available and in use in more advanced realities. There is a significant delay in this field that needs more attention.
3. Of the twenty goals committed to Brazilian society – approved by the National Congress and sanctioned by the President of the Republic – Dilma Rousseff, only one target was accomplished. Even this one with doubts due to the lack of a credible system for evaluating higher education quality. Target number 13, related to training masters and doctors, is doing well, but to what extent there has been an improvement in the quality of higher education is unknown. The goals and their strategies are in the detailed PNE Monitoring Report issued by INEP - National Institute of Educational Studies and Research in 2018 through the link

below http://estaticog1.globo.com/2018/06/07/resumo_relatorio_pne_2_ciclo.pdf? ga=2.165836856781960327.1575237267-843202671.1574002138

Several factors explain this failure and loss of effectiveness in the country's political and administrative life: the impeachment process of President Dilma Rousseff, paralyzing congressional activities for almost a year; the difficulties with the political crisis generated by the opposition, and coup accusations during the Temer administration; the deteriorating economic situation and now another two pandemic years with inoperative and confused education ministers of the Bolsonaro government.¹³

6.6. Crossroads of Hope and possible alternatives

It is necessary to look at the scenario described in the previous sessions as historical events that, despite their inevitability, cannot fail to serve as marks of the present and understand the need for a new identity for our educational process.

¹³ The INEP – National Institute of Educational Studies and Research Anísio Teixeira provides a vast collection of information about the PNE, objectives and strategies, obviously not critically and clearly regarding non-accomplishments and reasons.

See file:///D:/Users/Jo%C3%A3o%20Wiziack/Downloads/pne_2014_2024_linha_base%20(2).pdf

According to Brandão (1982, 1992a, 1995), universal social practice “aimed at developing, in children and young people, the skills and knowledge that would facilitate rapport with the rest of the group is clearly constitutive of an educational process” (p.100). However, the search for knowledge is already a process with its own identity of greater complexity, which, according to the author, has not always been articulated without tensions and disputes among the various disciplines, “leaving no basis for the development of a general pedagogical culture, a kind of epistemological ground, which guarantees permanent dialogue between specialists” (p.112)

Thus, in my view, some fundamental evaluative reflections are for the PNE's recovery path – 2014/2024:

According to Giroux (1999), Schools are cultural institutions or cultural borders and not just training grounds for the economy. Learning before becoming critical has to be meaningful for students, and he adds that we have a theory of knowledge but not a theory of Pedagogy. This is what we really lack, which needs to be sought by education actors, giving the deserved pedagogical extension to teaching and learning and thus recognizing its complexity. There is no better way to stabilize a field than through pedagogy and its canonical foundations (Hirsch, 2012).

In this sense, those who understand education as a mediation process that allows the transformation of the current reality know that it is necessary to deepen the pedagogical alternative, as Saviani (2005, p.143) states when contextualizing his theory of historical-critical Pedagogy:

If education is mediation within the global social practice, and if humanity develops historically, a certain generation inherits a mode of production with its respective means of production and production relations from the previous one. And the new generation, in turn, has the task of developing and transforming the relationships inherited from earlier generations. In this sense, it is determined by previous generations and depends on them. But it is a determination that does not nullify its historical initiative, expressed precisely through the development and transformations it operates based on previous productions.

We are, in fact, at the crossroads of a path that leaves no doubts about the need for a definitive and historical stance in search of a critical transforming identity that chooses education with its feet in contemporaneity driven by technological innovation and from

anthropoetics (Morin) to planetary citizenship. It is necessary to catch up with the 2014-2024 PNE or, sadly, stop and fall into civilizing barbarism. It is up to the current generation to mobilize everyone involved to take a stand and adopt a transforming pedagogy for this country definitely.

6.7. Possible rational and political choices

There are two dimensions to consider: pedagogical policy and management, which refer to a human effort to implement strategic actions already provided for in the PNE to recover lost time to fulfil a democratically designed plan approved by the National Congress and sanctioned by the Presidency of the Republic. There is a political climate for this in Congress. Still, the major obstacles are occupied by the CPI- Parliamentary inquiry committee (on Covid 19), which would require strong leadership from the current minister of education and the practice of a democratic management model with the capacity to carry out. It is necessary to give a voice to the existing structure and forums so that they can contribute to the decision-making discussions and achievement of the plan's objectives.

This would involve someone with potential and experience in Strategic Management (medium and long-term objectives, time, human resources, climate analysis, understanding of national culture, environmental analysis, and political movement, etc.); Financial management; Time management, performance management, and notably leadership management with which it will share the extensive and complex Brazilian educational agenda to obtain results approved and expected by the National Congress, sanctioned by the President of the Republic.

According to Ivancevich & Matteson (1990:387), leadership is defined as an attempt to influence followers' activities, and motivation is an essential factor for this. "Influencing someone's motivation means getting them to want to do what you know should be done" (Robbins, 2003:314). Someone who can bring a group together around a goal and deserve admiration and respect as a basic condition of leadership.

As already mentioned, the targets are not being met as necessary. As a result, as well as the data offered by the 2016 ICT Education Survey, they will continue to be repeated, showing evidence of progress far below the country's needs. Daniela Costa, the research coordinator, affirms the current voice in the educational environment, saying that "the school

needs to adapt to the digital culture, which involves rethinking its organization, curriculum, its entire culture.” In addition, she also understands that “connectivity can not only improve the teacher's work but also support the autonomy of students and launch schools to rethink their dynamics beyond their walls” (Carta Educação, 2017).

The PNE – National Education Plan does not include in its 20 goals a single executive action aimed at the technological modernization of the learning process. Recently there was a demonstration, “fall from the sky,” amidst the political turmoil of the transitional government of Michel Temer announcing a significant investment in technology in education until 2024 (MEC 2017), that is, within the term of the current Plan.

This is the – *Connected Education Program* -; according to the goals published on the MEC Portal: <http://portal.mec.gov.br/component/tags/tag/47511-educacao-conectada>, all 146,000 schools in Brazil must have high-speed internet access until 2024. Currently, around 18 thousand already have this feature. The perspective is that in the coming months, the reach will reach 22 thousand schools, which means 12.8 million students or 40% of enrolments in elementary and high schools. Decree supports Program No. 9,204 of November 23, 2017, and Decree No. 9,319 of March 21, 2018, which institutes the National System for Digital Transformation and establishes the governance structure for the Brazilian implementation of Digital Transformation. As previously announced, it is still an initiative that can very well be resumed, reconfigured, and implemented by the current government.

Another of the most important points is the *Educational Responsibility Law*, a suggestion that was much discussed and requested during the preparatory meetings of the current PNE. According to the MEC portal, the creation of an educational responsibility law was already one of the topics discussed in 2009 by Minister Fernando Haddad: “We need to create a more active legal instrument for managers to comply with the agreed goals, to guarantee the right to learning,” defended Haddad, referring to the law that would make the PNE a constitutional provision with real and legal commitment from its managers.

According to information registered by the Chamber of Deputies on 06/29/2017, the Special Commission approved the *Educational Responsibility Law (PL 7420/2006)*. One of the excerpts that I regard as fundamental in the approved text follows below:

Once the quality parameters have been approved, the National Institute of Educational Studies and Research, INEP will disclose the indicators that

public administrators must follow to ensure the improvement of basic education every two years. Anyone who does not prove that progress has been made will be covered by the Administrative Impropriety Law and may face penalties such as losing public service and suspending political rights for up to 5 years.

Another necessary political-administrative action is the finalization and implementation of *the National Education System*, aiming to organize the actions and responsibilities of federated entities given the objectives and results foreseen in the PNE. The proposal of an SNE – National Education System presented by Demerval Saviani still during the preparations of the National Conference on Education (CONAE 2010) for the organization of the PNE 2011-2021 referred to a coherent set of various organizational units mobilized and intentionally brought together to form a set of activities aimed at the effective operation of the educational processes planned in the PNE. As the proposal's author says, it is not a "monolithic, undifferentiated unit, but a unity of diversity." Therefore, it is in no way alienating the federal regime and only collaborating for collaboration between levels of government, facilitating the combating of existing inequalities in Brazilian Education.

However, it turns out that the parliamentary process for organization, structure, and discussions for the approval of the proposal proved to be a very complex process, full of political disputes, the details of which also do not add any justification or explanation found. It remains to be said, however, that this important proposition has a close relationship between the education system and the education plan, considering the author that "the formulation of the National Education Plan is a requirement for the National Education System to permanently maintain its characteristics own" (Saviani, 2008, p.80).

The current stage of this important political construction is at a standstill. "Article 13 of the law that instituted the PNE indicates that the National Education System should have been created by 2016. However, *this has not happened until today*. The challenges of overlapping roles, on the other hand, persist. Thus, the SNE continues to be a relevant discussion for the country, accumulating many years of debate.

The Brazilian Educational System (which is not yet fully systematized between federated entities and the Union) carries an administrative and financial concern about who should pay the bill. However, there are no pedagogical standards and qualitative objectives yet designed for humanizing a planetary society. For example, the concerns expressed in 6 presidential terms

kept education in the reproductive model and even without accomplishing the mission of supplying talents for the dominant capitalism.

In almost two and a half years of administration, with three ministers of education, there has been no talk beyond propagandistic ideological issues of a suffocating opposition and absolutely devoid of content on issues such as non-party school, gender ideology, singing of the national anthem before the classes, creation of military schools, encouragement of professors' witch hunts and attacks on public universities where they only make "rumblings and plant large fields of marijuana" (Statements by Minister Weintraub) and many other more idiotic or false and irrelevant issues. Anyway, today, there is no information about the literacy system that is so popular with replacing any idea that has anything to do with Paulo Freire. Obviously, there are currently no books and guidance manuals to publicize what literacy means now away from the figure of Paulo Freire. One does not know what to do. There are no plans for Education in the sense of taking over and understanding and solving problems, revising the existing program, and vigorously resuming constructive actions. Take, for example, the severe problem of planning and executing the production and distribution of textbooks that was shown in an article and which, although not the responsibility of this government, offers an urgent opportunity for corrective action in the process as a whole. See the link: <https://globoplay.globo.com/v/8149602/>

Finally, it is up to us to comment on the financial dimension neglected since the Fernando Henrique Cardoso government, whose theme was deeply discussed at CONAE (2010) and which obviously cannot be postponed for us to face the challenge as a country, considering that Education as a social right established in Constitution is the duty of the State and constitutes a priority ahead of countless other items. If we want to meet the set goals with our social and cognitive development commitments to produce answers to future needs, we have to make the right choices to cope with the resulting burden. There are no miracles but sacrifices and intelligent and ethical choices to be made, in line with the perspective pointed out by Moran (2000, p.14):

An innovative, open, dynamic organization with a coherent, participative pedagogical project; with adequate infrastructure, updated, comfortable; with accessible, fast, and renewed technologies. An organization that brings together well-prepared teachers intellectually, emotionally, communicationally, and ethically; well paid, motivated, and with good professional conditions, where there are

favourable circumstances for an effective relationship with students that makes it easier to get to know them, accompany them, and guide them.

The National Education Development Fund, a federal autarchy created by Law No. 5537 of November 21, 1968, and amended by Decree-Law No. 872 of September 15, 1969, was created precisely to improve the quality of education by implementing all educational policies of the MEC. Other funds, such as FUNDEF – Fund for the Maintenance and Development of Elementary Education and the Appreciation of Teaching and FUNDEB – Fund for the Development of Basic Education, constituted by municipal state collection and federal fees and social contributions, were created. Redistribution is based on the number of enrolments in the public and/or partner school network and covers all basic education. This fund replaced FUNDEF. It lasted from 2007 to 2020 and was fortunately renewed. If it represented advances as claimed, the fact is that it was becoming history. Another point not to be forgotten is that the management of this fund attracted the greed of the famous Big Center (Centrão) during the negotiations in support of President Bolsonaro.

Other funding resources were established. However, there is nothing to comment on, except that it is complicated for management to understand and transparent operation and insufficient. It is prevalent to hear that progress has been made here and there on these issues, but no one is willing to keep reading the stories of funds and funds that today represented nothing for their roles' essential fulfilment. Many kinds of research, texts, books, and dissertations were built on this theme (including my master's dissertation). They were nothing but hot air, recording an innocuous and sad story.

This only reinforces previous statements about the need for an Educational Responsibility Law and the creation of the SNE due to ultra-necessary and respected planning such as the PNE.

There are no more, and no arguments hinder us from adopting a severely critical, reflective, and transformative pedagogy for Brazilian Education. I would even say revolutionary in the true and positive sense of the term.

6.8. Reflections and new paths

6.8.1. History repeats itself or just runs its course

Any statements made by the authors in this session mean, at the same time, a reflection, and an ardent search for a new path to the destinies of a gigantic country, with great human potential, natural resources, biodiversity, cultural diversity, geographic extension, location, however inferior in terms of dreams and military determination of its population, as well as low level of moral autonomy and consequently in deficit with their educational needs.

Our history, as an organized process that puts living beings in contact in a dialectical relationship, producing culture, habits, and values in common for the continuity of life (Paiva 2014), emerged from Jesuit pedagogy or rather Saviani's pedagogy Brasília (1549-1599) (2008), whose strategy starts from the domestication of the indigenous people, subjugating them to the learning of Portuguese and the teaching of Christian doctrine, pedagogical ideas absolutely in line with the "objectives of disciplinary, moral and intellectual conformation to the new conquered situation" (Saviani, 2008, p.44).

The author continues by mentioning that Nobrega understood that it was “good for the Indians to remain subject and fearful and willing to receive the Gospel now, and the doctrine of Christ” (Nóbrega, 1992 p.236 apud Saviani 2008). Saviani adds that the pedagogical ideas put into practice by Nobrega and Anchieta to fulfil the goals of the conquerors took into account the principle whereby "the Catholic religion was considered a work of God, while the religions of the Indians and blacks coming from Africa were the work of the devil” (Saviani 2008, p. 47).

One of the educational projects that we have become aware of recently is the National Program of Civic-Military Schools - Pecim, created by Decree No. 10.004, of September 5, 2019. I immediately present my severe opposition. If the Jesuit pedagogical ideas at least followed the cultural context of the time, the military pretensions are preposterous, anti-democratic, not discussed in the educational sphere, and only unilaterally decreed. These are not Military Colleges like those under military command, but schools for basic education, in which around 1,000 reserve officers will be installed and will receive a 30% bonus on their earnings. According to the news, of the BRL 54 million reserved for the action, BRL 28 million will be transferred to the Ministry of Defence to pay these extra retirement bonuses. (Folha de São Paulo: 11/21/2019. Available and accessed on 12/9/2019 at:

<https://www1.folha.uol.com.br/educacao/2019/11/mais-da-metade-do-civic-military-schools-budget-in-2020-will-pay-reserve-officials.shtml>.

Obviously, this initiative is meaningless and should leave Educational Planning to future management, returning to the framework of the already existing military vocational schools.

Several pedagogical ideas have passed from Nóbrega to 1988 and from then to 2019 precisely, 470 years. At each historical time, for one reason or another, we need a reflective critique and transformative actions, which in most cases did not occur, leaving Brazil at the mercy of dominant hegemonic ideas.

As for the current indigenous peoples, under the slogan of “God above all and Brazil above all,” this government is leaving the Amazon jungle in the same fate, in other words, “taking advantage of the fact that the press is focused on the pandemic, let's let it go the herd and approve everything we need” (Minister of the Environment at a meeting of the ministries with the President of the Republic on April 22, 2019). Thus, the structure of management and inspection of the forest was weakened, and burning, deforestation, and mineral exploration became banal, including the invasion of indigenous lands. They want a new conformation of the Brazilian people to interests situated to the far right of the most retrograde and exclusive ideas of a small family nucleus in charge guided by a bar philosopher.

6.8.2. Reflections and reactions to chaos: a contributory synthesis

We thus vehemently justify the need for inspiration in the pedagogical ideas of Giroux, Saviani, and notably Freire as a vital process of changing the status quo of Brazilian education.

It is not easy to measure the social transformations that have occurred since the turn of the millennium. We expected a different world, with more significant potential for producing wealth and distributing world income, but extremely far from this reality in terms of the humanization process.

We never imagined the extent of Negroponte's (1995) predictions and warnings about digital vandalism, data theft, invasion of our privacy, abuse of intellectual property, software piracy (p. 215), and even fraudulent elections of presidents of the republic for the use of false news spread by robots and intelligent and well-informed people on the networks, aided by others ignorant spreaders eager to show in their groups the latest impacting news from the internet. The mainstream media even created their checking departments to maintain the

credibility of their vehicles, increasing the combat network already started with several specialized agencies

The internet world is a space that requires cognitive skills. Even the most straightforward applications used on social networks and stored on smartphones require knowledge and skills to be learned. Just look at the following link as an investigative curiosity in which two young “Nerds” show with all irreverence what the deep web is (<https://www.youtube.com/watch?v=9lVR41uYGmU>).

Educational processes can be much more developed if technology is used within the correct pedagogical application. This perception, the result of observations of teaching practices and academic referential research, then created the conditions for the proposition of the ICC framework -Integrated cognitive competencies presented in Congresses, published in annals, and recently published in Heliyon., whose concluding discussions now provide opportunities for some contributions to our educational process. See figure 25.

It is about knowing how to act resulting from the combination or integration of knowledge, skills, and teaching attitudes applied in mediation activities in the classroom in the face-to-face or distance model and via moodle or transmissions of any kind.

The following design graphically synthesizes the model already demonstrated in this study in which:

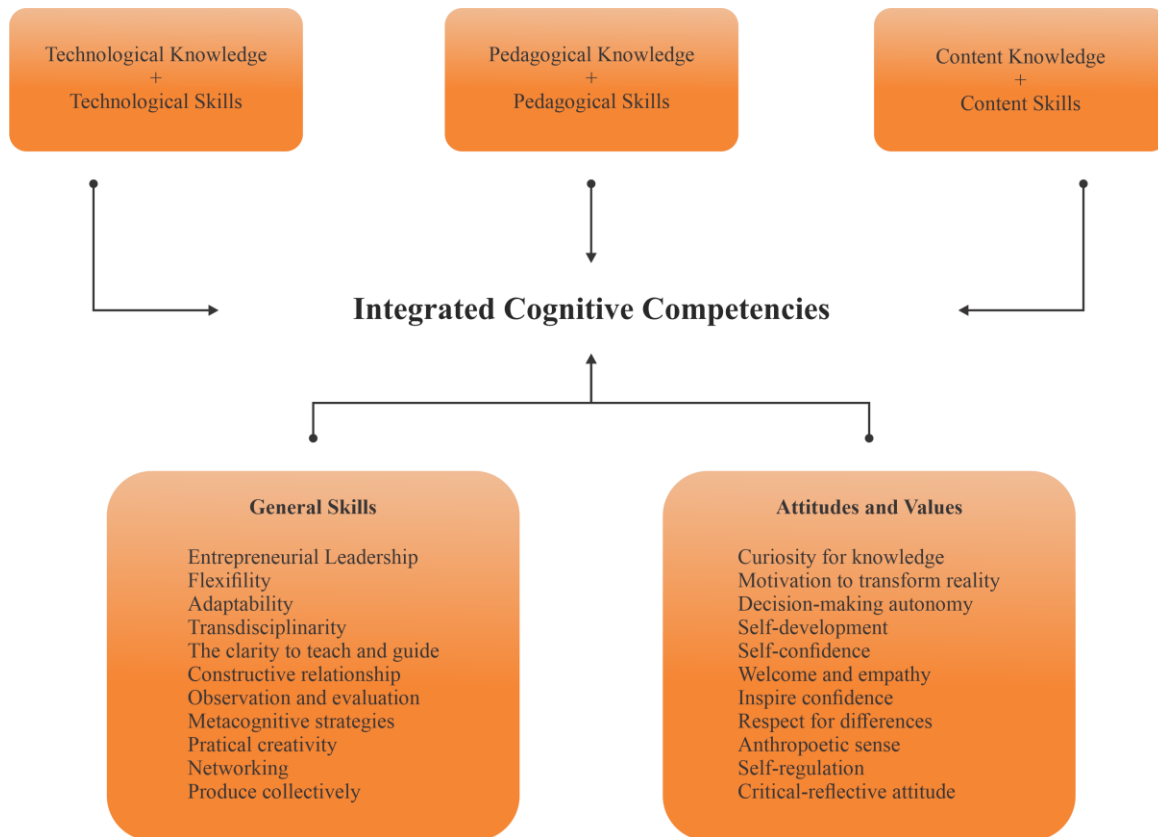


Figure 25: ICC – Integrated Cognitive Competencies model.

Authors, with the adaptations taken from Koehler & Mishra (2007), Bandura (2008), Morin (1999), and Xus Garcia & Josep Puig (2010)

- Mastery of subject content is essential for integrated learning and enabling the choice of pedagogical resources to be used.
- Pedagogy, somewhat in the background until the advent of technology, acquired the importance of an essential domain to effectively allow technological uses in the learning process.
- As already stated, the use of ICT is limited to the same social use. There are many possible and available resources, but they require adequate skill for effective use.

- Behaviors and attitudes of self-efficacy and control mean the difference in the best result of the teaching work. There is no doubt that teaching work is not valued and recognized in our Brazilian society, much less by our governments specifically. The last place in the Global Teacher Prize ranking serves as undisputed proof of this reality.

From the point of view of the humanities, teaching work is, in fact, a composite of different life stories of people who, in addition to disciplinary content, need self-control to know and help the student, the great object of their mission. CCI includes structured motivation (Becker, F.1992), a concept that this author uses to name the context of the teacher's environment and the challenges he faces in exercising his transforming mission. Structured motivation results from the personal conditions of the teacher, the student, the family, and the school, which can contribute to, facilitate, or not the achievement of the expected goals.

The focus groups composed of experts working in Brazilian education strongly recognized self-efficacy (Bandura, 2000; 2008) as this human capacity of motivation to overcome obstacles, allowing human beings to extract meanings from the difficult environments they face, developing action strategies for problem-solving cognitively putting into practice their anticipation skills and seeking new knowledge to develop action scripts in daily practice.

There is an experience by a director of a school unit on the outskirts of greater São Paulo who at one point found a temporary action strategy to allocate lockers with padlocks for some armed students who came to school to store their revolvers. Their claim was the risk they faced with enemy gangs on their way to school. We argue that the example does not serve for criticism but to focus on understanding the reality experienced in public schools on the outskirts of large cities facing a difficult situation for managing and making a decision.

There are also, for reflection, stories of teachers who, realizing the state of behavioral change of children in the classroom, when talking to their mothers, received information from them that it was about sexual abuse by fathers or stepfathers, drug dealers, and who silenced these mothers with death threats.

Repeating Macedo (2004, p. 32), these factors involving teaching life require the practice of reflecting on the reality of this environment, “kneeling before it (my emphasis) and

so who knows, being able to correct, compensate, replace, improve, anticipate, enrich and give meaning” to what was and still needs to be done.

The new information technologies offer a great variety of pedagogical representations for the different specificities and disciplines, but they demand learning by the teachers, still mostly digital immigrants. Technological skills need to be part of teachers' training curriculum in association with pedagogical learning and supported by specialists within school units until the assimilation of instructional and technological skills reach a level of proficiency in the digital school culture.

For inclusion in the strategies of Goals 18 and 19, the learning of technological applications in an integrated manner must be supported by a great initial effort by the MEC to offer instructional resources with distance technological applications covering in a planned way all curricular contents and making use of all the good initiatives established in the external market already available, as well as in the laboratories or innovation centers developed inside the schools.

There is room for numerous good pedagogical consultants operating in the country for the MEC to organize an extensive program to overcome this deficiency, serving teachers regionally and helping schools conduct a technological program instead of just maintaining the few activities that begin with the computer labs. One of the professors interviewed as a methodological part of this thesis attested to the difficulties encountered. Still, students and professors' great benefits and motivation are beginning to become interested in technological learning.

This development activity may be associated with Target 17 as a strategy to encourage the career plan and eventually to some salary bonus, as long as it is computed from the normal salary.

In the composition of a project for the planned and effective adoption of technology in the teaching and learning processes of the Brazilian System, the inclusion of the propositions below as synergistic to the Programa Educação Conectada (if it is still active) must also be considered.

1. Institutional isomorphism ensuring participatory management by applying resources and observing regional needs and potential. It was seen by the evaluator groups as a

major factor of attention in project management, considering that it can be misinterpreted as equality between situations that are very different due to regional/cultural issues or different stages that require action patterns that are equally different from more advanced ones. It also means the equitable conduct of policies in line with regional needs and capacities.

2. Education should be governed by *Principles and guidelines* rather than rules and normative pressures for enforcement. Education *as a transforming action* does not transfer knowledge. Still, it must deal with *teaching mediation* with the world outside the school, seeking technological integration and assimilation, and developing an innovative spirit in an environment of openness and democratic and responsible participation by all involved. This thought definitely guided the vision of the project. Thus, the Guiding Principles and Norms favouring Teaching Quality and the clear and shared decision-making process between the regional and federal levels will also be seen, respecting cultural aspects and diversities throughout the country.
3. In the aspects of technological infrastructure, the greatest recommendations are made to carry out great care, technical planning, and effective implementation. The digital communication network has to bring all schools together and manage all information intelligently and sustainably, ensuring quality management and credibility in data and results. This technological delay definitely needs to be overcome. Brazil can bring together and mobilize large companies in the technology sector around this great objective to benefit everyone. Enough of creating little projects that only promise and do not come out of it. Great mobilization is needed in this effort. There is a lot of money in infrastructure and the acquisition of the great technological innovations already available in the country
4. In terms of financing, it is necessary to concentrate efforts on implementing a robust program of technological adoption, installation of sustainable infrastructure, and at the same time, training and development of digital teaching culture. Without a doubt, it is necessary to find a billion-dollar reserve, even at the cost of long-term external financing, and to mobilize all possible forces in this direction. In Brazil, many organizations could work as suppliers linked to Federal Universities and their

Pedagogy and Engineering departments to produce instructional resources and techno-pedagogical training for teachers, including the inclusion in the curriculum parameters. The disastrous experiences of attempts to offer distance learning during the pandemic clearly show that this is a way forward.

Indeed, a partnership program with the private sector, including the international one, could mean a good path in searching for financial resources. The 5G technology auction timing could already be a great start. After all, a country with countless arenas for a World Cup cannot turn its back on a much more noble and constructive project

Looking at the whole problem involving the urgent need to enter the technological context through education, political difficulties and tensions due to the internal climate and relations with the outside world, and the need for balance in the country's economic management, nothing scares the achievement of these important ones anymore, but challenging goals that the fear and insecurity caused by the lack of credibility and ethical behavior spread throughout the national environment, from the Supreme Court in Brasília, through the National Congress, Presidency of the Republic, state governments, deputies and even mayors and councillors of cities outside Brazil.

This pessimistic view clarifies that the critical pedagogical alignment rejects and faces the political struggle at a time of global civilization crisis with local consequences. In this context, the technological moment of contemporaneity goes through the expansion and overcoming of our limits, demanding the development of new competencies for the sustainability of the civilizing process within ethics for the human species (anthropoetics, according to Morin) aimed at rethinking humankind.

Digital technologies seem to conspire with authors born long before them by allowing the democratic, deterritorialized (Levy 1977) and access to a real-time information environment to determine a pedagogy for learning and living in the new reality. Just reinforcing the critical concept invoked, “social practice is, therefore, the starting point and the arrival point of educational practice” (Saviani, 2008, p. 422), in which teaching and learning also mark the meeting between teacher and student for the same journey.

6.8.3. Limitations and further studies

Initially, it is necessary to recognize that the facts show us that, unfortunately, we are extremely on the edge of resistance. The metaphor with Dante's Hell was a natural appropriation that popped into my mind while writing the last chapter. Unfortunately, there is an ideological confrontation in the country between the extreme right, center, and left, preventing any constructive strategic action favouring education. With new elections in 2022, we have the chance for a fresh start.

With the path clear, it is necessary to walk and defeat a list of needs, including them in the PNE. Still, it is essential to recover the meaning of the school in the educational process in Brazil, moving away from the tendency of taking the managerial vision and strategy contaminated by the corporate world of global business, including the unique idea that the best way is delivering Education to the private sector. It is necessary to understand the creation of a PEC- Proposal for a Constitutional Amendment to guarantee Education as an activity carried out by the state. That eventual outsourcing would only occur to purchase complementary instructional resources and subordinate to the federal management of Education itself.

The fundamental concepts to be recovered and taken care of as educational values are also valid for private schools. Even subject to the business, profit, and investors model, they cannot renounce that this activity is subordinated to the socio-educational interest democratically defined by its national pedagogy. The PNE – National Education Plan is this "locus" repository of ideas, plans, processes, didactic-pedagogical innovations, and actions to put into practice.

From this perspective, the educational and organizational content thought and planned in the PNE must respond to the institutional complexity dictated by regional cultures, including its multiple diversities and political dynamics. However, all this content must be gathered under a management model that can interpret, understand, and carry out all planned actions in the context of a social organization by nature. Our next work includes discussing these and other items already mentioned in participating in the PNE review activities in case the current governor observes his constitutional responsibility.

7. Final conclusions

Finally, it is necessary to rebuild the MEC. Recover the organization and positions with the needed competencies. Recompose the MEC's management integration with the active participation of a council composed of deans of public universities in the country. The Minister of Education should have an excellent educational background and an experienced manager. Someone with preferred Human Sciences competencies and extensive experience in managing complex organizations.

They must have a distributed leadership profile capable of dealing with distinct categories of challenges. They will need to have relative knowledge and the ability to help those who directly deal with the direct management of these challenges. This includes Strategic Management (with short-, medium- and long-term objectives, time and urgency, analysis and interpretation of organizational and political climate, human resources, national and regional culture, diversity management and perception of the political environment, etc.); Financial management; Change Management, Performance Management and notably Leadership Management that shares the achievement of actions to achieve planned results.

According to Ivancevich & Matteson (1990:387), leadership is defined as the attempt to influence followers' activities and being motivated is an essential factor. So also influencing someone's motivation means getting them to want to do what you know needs to be done (Robbins, 2003:314). Without a doubt, managing a Ministry of Education is a highly complex and challenging challenge. It is not an activity for any friend of the President of the political party.

Numerous leadership models can be observed, analysed, and carefully applied. However, it seems that distributed leadership, sharing objectives, and managing results and responsibilities with other leaders of significant importance seem to converge more democratically and effectively. This design or style is more in line with forming a group of leaders to consolidate actions that, according to Hargreaves's (2003) vision, can create the future (with sustainability), preserving what is necessary from the past. Furthermore, according to the author, this formative process preserves, protects, and promotes the fundamental moral purpose of deep learning in education.

The only way for a Minister of Education to manage a complex organization like Brazilian Education is to have competent academic leaders at all levels and categories of educational activities (Bisbee, 2007). On one side of its organization chart in the MEC, there would be the technical, pedagogical, information management, technology, and innovations sectors, etc., and on the other, the Council of Rectors. It is necessary to bring public universities closer to MEC management, giving them a responsible and participative role. A Minister of Education profile should include talent in management and distributive leadership (Hargreaves), chosen from a list coming internal candidates and prominent exponents of the executive professional market. The hearing taken by a Senate Committee should be a form of participation held valid as final approval. The PNE as strategic planning, national corporate values inspired by the federal Constitution and objectives democratically expressed by the academic community, and the participatory environment of the political representation of the people would give real life to the Plan, advancing through different mandates within an organized context of updating as already established today.

New life for the PNE has an excellent organizational design structure but no co-responsibility instrument for its effectiveness and delivery. Enough of not meeting goals.

This subject could also be an outline for a sizeable post-doctoral project. It could undoubtedly produce objective research for constructing a project that would help Brazil overcome difficulties and start building a real future.

The final word is left to the patron of Brazilian Education, who urges us to think about the political perspective on how to be in the world conforming man, disintegrated from reality, suffocated by hegemonic thinking, unable to transpose the limits imposed on them by the world itself. The digitally illiterate person can also be considered today as being immersed in the world and living without awareness of their reality (Freire, 2003).

For Freire (1982, pp.27-28), education "is the answer to the finitude of infinity, and it is possible for man because this is unfinished, and he knows he is unfinished." It is interesting to understand incomplete knowledge as awareness and knowledge of limits, not weakness.

It's too much to hope that today's politicians, common sense thinkers, can understand the meaning of Paulo Freire for our culture and social sustainability. We are unfinished, yes, as awareness and knowledge of limits, but never weak and barely started!

Critical pedagogy points to a new political awareness and global social responsibility. We have already assumed the fear of death and economic loss. We must embrace the collective conscience to change and innovate, leading our Destiny (Wiziack & Santos, 2021).

Finally, we leave and share a good reflection for all of us who, in recent times, have experienced so many things, standing at home and masked, mixing fears and madness, sometimes losing hopes we already had and fuelling revolts as if we could clean up our ruined house. We did this and much more, united by networks, nailed to powerless hubs, crossing roads, and running over innocent people with our stupid speed in wanting to fake more than to share. And now, what can we do?

“Do not look back!

Not everything is how you want it, and not everything can be perfect

It can be easy if you see the world differently.

If what's wrong turns out right, things are as they are

If so much information blinded intelligence

If it doesn't make sense, disagree with me, it's no big deal.

It's water under the bridge, choose another road, and don't look,

Don't look back!”

Many thanks, Dinho Ouro Preto & Capital Inicial- Brazilian Rock Band

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Appendix A: *Research profile* presented in Chapter 5, table 14.

General data: gender, age, formation, years of experience working in Communication & Marketing, Tools, technologies, and processes that you know and/or use listed below

Sample profile

Gender	Frequency	%
Male	31	41
Female	45	59
Total	76	100

Scholar level

Graduation	36	48
Specialization	34	45
Master	04	06
Ph.D.	01	
Professional experience: 0 to 2	15	19
2 to 5 Years:	19	25
>5 years:	31	42
N/R.	11	
Total	76	100

Use of Computational tools

10 Most known: (+ to -): CRM, Business Intelligence, Big Data, Google Analytics, Adobe Illustrator, Adobe Dreamweaver, ERP-Operational Planning Systemic, E-mail marketing, ROI- Return on Investment e Adobe Photoshop

10 Most used: (+ to -): E-mail marketing, Google Analytics, Metrics in general, SEO- Search Optimization, Adobe Photoshop, Google Adwords, Adobe Illustrator, CRM, Business Intelligence, RD Station

Total tools surveyed: 31 **Average users of 10 +:** 18%

Average age of the sample: 28

Appendix B : Likert questionnaire applied in Chapter 5

A questionnaire with statements and sources inspired by the objective of choosing the measurement indicators of the variables tested in the constructs and hypotheses:

1. List of Computational tools inquired

2. E-Procurement	3. ERP–Operational Systemic Plan
4. BI – Business Intelligence	5. Data Mining
6. Data Warehouse	7. Management Information System (MIS)
8. Decision Support Systems (DSS)	9. Marketing Information System (MIS)
10. Diverse Internet Systems	11. Big data analytics
12. Artificial Intelligence Systems	13. SMAC : social, mobile, analytics, and cloud
14. CMS – (Content Management System)	15. Buzzsumo/Backlinks or similar
16. Google Analytics	17. RD Station
18. E-mail marketing	19. SEO – Search Engine Optimization
20. Google Adwords	21. Personas Generation
22. General metrics	23. ROI – Return on Investment
24. Adobe Photoshop	25. Adobe Lightroom
26. Adobe Illustrator	27. Adobe InDesign
28. Adobe Premiere Pro	29. Adobe After Effects
30. Adobe Audition	31. Adobe Dreamweaver

2. Statements and inspiration source

Statements	Authors/inspiration
1. Mastery of general content in communication and marketing is essential for integrated planned results and management of process variables	TPACK – Koehler & Mishra (2007)
2. The conceptual and practical mastery of the pedagogical application of digital technologies or at least an understanding of their effects and objectives determines effectiveness in the results	TPACK and Shulman (1986)
3. The knowledge and correct application of technological resources and decision support systems are essential for the quality and speed of responses and results	TPACH and Shulman (1986)
4. It is suggested that Communication & Marketing professionals dominate in 3 categories: a) knowledge of the area's contents; b) knowledge of the most appropriate technological tools; c) knowledge of the project's interrelationships with the social and economic context.	Authors based on TPACK main concept
5. Pedagogical knowledge in Marketing refers to the competence to represent ideas with the best possible analogies, illustrations, examples, images, and experiences in a way that consumers and customers understand.	Authors based on the main concept of Shulman's pedagogy
6. Competencies related to the internal content of people motivated by self-efficacy add to the formation of entrepreneurial behavior and sustainable, ethical management.	Bandura (1995; 1977)
6. The world connected in its changing culture asks Communication and Marketing professionals to act in self-control, ethics, and moral autonomy, contributing to the defenses of social values and considering the opportunities for exercising influence and persuasion in consumer relations.	Authors based on Bandura, Yves de La Taille, and Yanaze's concepts
7. Considering that technology is already part of our lives, these competencies should be part of the curriculum from basic education to professional specializations as a pedagogical project in schools.	The consuming as impact on individual and collective values in Campbell 2006; Bauman 2008 and Braga 2020)
8. Recognizing details related to the economy, researching and interpreting the changing social scenario, and evaluating and interpreting research into its metrics and effects is an important competence in Communication & Marketing.	The influences of social belonging and uncontrollable desires arising from the self in Campbell (2006).

9. Monitoring intelligence data captured in the market at sales and business forums contributes to a professional profile with differentiated performance in Communication & Marketing.	Studies on consumer engagement. See in Hanna, Rohm, & Crittenden, (2011).
10. Work in Communication & Marketing means a responsible "knowing how to act," which implies mobilizing, integrating, and transferring knowledge, resources, and competencies, in actions that normally affect people's lives, in addition to adding value to the rapidly changing environment.	Fleury, M.T.L., & Fleury, A. (2000) competence concept.
11. Integrated cognitive competencies in Communication & Marketing refer to the intellectual ability to master technical knowledge, however, followed by knowing how to deal with concepts and theories, knowing how to make generalizations, apply terminologies, elaborate choices and evaluations, relate, and integrate content to the best understanding of consumers and customers.	Social references, social inclusion feelings, self-image studies, Su, & Reynolds, (2017), Sahour & Dragomir, (2018)
12. The so-called sense of ownership implies detailed knowledge of the business and the strategic variations adopted in operations and the search for innovation, and an attitude of renewal in thinking and doing.	References on concepts of Foroudi, Gupta, Sivarajah & Broderick, (2018); Prentice, & Loureiro, (2018); Shankar, & Jebarajakirthy, (2019).
13. Technological evolution and new tools for customer service and engagement contribute to greater success in Communication & Marketing activities.	Idem
14. The digital revolution producing new forms of communication and social relationships allows research and understanding of current and future consumer behaviors and needs.	Bhattacharya & Sen (2004); Kotler & Armstrong (2003.); Carrol, (1999); Silva et al., (2012);
15. One way to understand consumers is to study their preferences and behaviors demonstrated on social media, blogs, search platforms, and brand websites, as well as in mass media.	Rizzo (2017); Moraes, Braga Junior & Lourenzani, (2015); Lepthien, Papies, Clement, & Melnyk, V. (2017).
16. An essential basic condition for developing contact competencies and observing consumer behaviors are didactically oriented sales experiences	Market general experiences and trade marketing process.
17. The Communication & Marketing professional must guarantee information, policies, and practices with ethical and moral content, contributing to the perpetuity of the business and building loyal commercial relationships.	Sheth, (2011); Peter, (1979); Jain, R., & Bagdare, S. (2009); Venkatesh et al. (2003); Luxton, Reid & Mavondo, (2015).
18. I believe digital marketing tools allow greater control of information about consumers and customers due to the speed of actions and possibilities for engagement.	Authors based on contemporary market experiences

19. As a student or professional, I emphasize the assimilation, incorporation, and use of computational tools and information systems applied in contemporary Communication & Marketing to facilitate and effectively obtain results.	Authors based on contemporary practices observed in the professional market
20. Interpersonal communication competencies and intense participation in social networks and blogs of interest to the business are differentials of practical and agile value for taking action.	Authors observation of digital marketing practices
21. They are precious competencies for the Communication & Marketing professional to seek relevant feedback, listen to criticism and suggestions sensitively to understand the target audience's manifestations, and develop competencies to generate influence and persuasion in their interlocutors.	Yanaze (2011; 2021) general concepts in marketing strategies
22. Training in Communication & Marketing must have a Pedagogical Project aligned with quality academic teaching practice, ensuring adequate and modern teaching skills and instructional resources	Tornatzky & Fleischer (1990); (TornaVeiga, (2005); Ching, Da Silva, & Trentin, (2014); Vefago, & Francisco, (2017).
23. One of the main benefits of building a strong brand comes with increased marketing communicative strength and greater willingness of consumers to accept and follow it cognitively, facilitating the assimilation of additional communications.	Keller (2009; Kotler, P., Kartajaya, H., & Setiawan, I. (2019).
24. I am completely self-sufficient in using technological resources in line with the needs of my work.	Authors
25. A good pedagogical project for communication & marketing training needs to have conceptual content aligned with instructional practices that reflect the reality of the professional market.	Authors

Appendix C: Convergent and discriminant assessment results at the level of measurement indicators

	CCU	TICC	TLO	PUB	SES	OCI	DPP
V10	0,840	0,490	0,638	0,526	0,429	0,298	0,620
V11	0,906	0,600	0,729	0,664	0,475	0,313	0,716
V12	0,851	0,661	0,709	0,683	0,448	0,338	0,651
V1	0,705	0,892	0,793	0,573	0,642	0,499	0,614
V2	0,400	0,815	0,610	0,562	0,684	0,577	0,468
V4	0,600	0,843	0,733	0,666	0,752	0,539	0,726
V20	0,734	0,818	0,918	0,685	0,713	0,590	0,737
V21	0,716	0,699	0,849	0,640	0,679	0,577	0,763
V26	0,562	0,596	0,759	0,567	0,611	0,443	0,441
V22	0,612	0,592	0,611	0,912	0,610	0,487	0,712
V23	0,739	0,684	0,785	0,834	0,751	0,410	0,801
V25	0,386	0,464	0,407	0,766	0,489	0,418	0,409
V15	0,459	0,648	0,594	0,745	0,712	0,649	0,541
V5	0,366	0,674	0,599	0,627	0,819	0,684	0,639
V6	0,453	0,669	0,709	0,486	0,788	0,573	0,406
V7	0,570	0,748	0,752	0,630	0,864	0,667	0,747
V9	0,299	0,581	0,526	0,442	0,824	0,637	0,454
V13	0,170	0,406	0,428	0,345	0,529	0,866	0,306
V16	0,326	0,590	0,584	0,513	0,729	0,863	0,437
V18	0,397	0,576	0,584	0,601	0,683	0,816	0,438
V17	0,702	0,425	0,592	0,654	0,419	0,250	0,822
V3	0,591	0,749	0,779	0,605	0,777	0,577	0,857
V8	0,537	0,678	0,641	0,724	0,703	0,544	0,837
V24	0,767	0,587	0,648	0,721	0,465	0,241	0,885

Table 17: Independence between the latent variables by Chin (1998) criterion.