

The Process Communication Model (PCM) as a Framework for Transversal Skills Development: A Quasi-Experimental Study in an Education Bachelor's Programme in Sport Organisation Management

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ABSTRACT

This study investigates a Process Communication Model (PCM)-based pedagogical intervention embedded in a transversal Power Skills module within an education bachelor's programme in sport organisation management. A quasi-experimental pre-test/post-test design without a control group (N = 52) was implemented and complemented by reflective learning journals. Transversal skills were assessed using a criterion-referenced rubric covering self-awareness, behavioural adaptability, stress management, interpersonal communication, situational leadership, and conflict resolution. Results indicate clear improvements across all competency domains. Reflective journals further show that participants transferred PCM concepts to everyday situations in educational and sport settings, illustrating increased self-observation, communication adjustment, and stress regulation in practice. Overall, the findings support PCM as a structured framework for transversal-skills development and assessment in a professionalising higher-education context.

KEYWORDS : Criterion-referenced assessment; experiential learning; higher education;

Process Communication Model; transversal skills.

1 Introduction

Morocco has undertaken a broader reform of its higher education system with the objectives of quality, good governance, pedagogical innovation and better linkages between the skills acquired by students in higher education institutions and the needs of the labour market. Framework Law No. 51-17 on Higher Education Reform was published in October 2017 to establish a new higher education system based on a competency, quality-based approach to improve the skills of graduates and their employment in the labour market. These objectives are also reflected in the ESRI 2030 Pact, which focused, among other aspects, on pedagogical innovation, research, good governance and graduate employment, in order to modernise higher education in Morocco. More recently, this framework was confirmed by the publication of Law No. 59.24 relating to higher education, scientific research, which should provide an appropriate regulatory framework to modernise the governance of universities, the management of the sector, in line with the major social and economic transformations underway.

These policy orientations exist within an international framework which demonstrates how soft skills in higher education have become more vital for education systems. The field of employability research demonstrates that contemporary workplaces require employees to develop abilities which combine technical competencies with communication skills, teamwork abilities, adaptability skills, leadership competencies and problem-solving capabilities (Andrews & Higson, 2008; Succi & Canovi, 2020). From an economic perspective, Deming notes that “[t]he labor market increasingly rewards social skills” (Deming, 2016, p. 1).

International organisations converge on this observation. The Partnership for 21st Century Learning identifies Learning and Innovation Skills as essential competencies for modern education which include critical thinking, communication, collaboration and creativity (P21, 2019). The OECD emphasises that socio-emotional competencies including curiosity, imagination, resilience and self-regulation skills matter because they support cooperation and adaptability in complicated situations (OECD, 2018).

Research studies have found multiple challenges when trying to measure and define transversal skills which students learn at university. The current programs operate independently from each other while their educational content lacks proper connection to the curriculum and they depend on student self-assessments for evaluation (Prince, 2004; Succi & Canovi, 2020). Scientists have not created proper assessment tools which prevent researchers from effectively measuring these skills according to Thornhill-Miller et al. (2023, p. 2).

In the Moroccan context, recent studies indicate a growing institutional interest in soft skills within higher education reform and professionalization processes, while also stressing that their integration remains ongoing. El Aida et al. (The authors (2024) explain that universities in Morocco now include soft (non-technical) skills in their undergraduate education because of the ESRI 2030 Pact (p. 82).

The education bachelor’s programs maintain their own distinct position because they aim to connect academic knowledge with teaching abilities and general competencies which teachers can apply during their work in intense educational environments (Touhami, 2020). The research data needs evaluation of educational curricula which implement particular teaching approaches to help students build their abilities through organised learning and assessment of their transferable competencies (Thornhill-Miller et al., 2023).

Research in labour economics shows that social and relational abilities have become more valuable in the job market because they are essential for work that involves teamwork and solving complex unexpected problems; Deming states that social abilities now receive greater compensation in the job market (Deming, 2015, p. 1).

Research shows that academic performance metrics do not assess vital non-academic abilities which determine student success in their educational journey and professional development (Heckman & Kautz, 2012). The present study demonstrates that assessment procedures function as major obstacles which prevent students from building their transversal competencies because there exists no appropriate evaluation system for these skills (Thornhill-Miller et al.,2023, p. 2).

The education bachelor's programs maintain their distinct position because they combine academic knowledge with teaching methods and essential skills which teachers require to perform their demanding educational duties (Touhami, 2020). The research data needs evaluation of educational teaching approaches which teach these programs because they require students to learn through structured educational methods and successful skill assessment systems (Thornhill-Miller et al.,2023).

Research in labour economics and education together with labour-market studies demonstrates that social and relational abilities have become more important for work environments which demand human interaction, coordinated task execution and creative solution development (Deming, 2017). Heckman and Kautz propose an alternative method which proves that soft skills cannot be assessed by traditional academic achievement metrics because achievement tests do not assess these competencies (Heckman & Kautz, 2012, p. 1).

Research evidence confirms the graduate employability field because employers require three fundamental competencies from candidates which include communication skills, teamwork abilities, flexibility skills for achieving work success and professional growth (Andrews & Higson, 2008; Succi & Canovi, 2020). The competences match international “21st-century skills” frameworks which describe abilities needed to succeed in dynamic and unpredictable modern environments (P21, 2009; OECD, 2018).

Organisations face difficulties when evaluating transversal skills because they do not have established evaluation methods which results in unpredictable outcomes from employee- based assessment techniques (Thornhill-Miller et al.,2023). Designers need to establish organised learning spaces which implement active teaching approaches and practical learning activities for student evaluation according to Prince (2004) and Kolb (2015).

The Process Communication Model (PCM) provides a systematic method to understand oneself which helps people adjust their communication style and manage stress but its effectiveness for developing cross-functional abilities like teamwork and leadership and conflict resolution needs more research in academic settings (Kahler, 2008; Collignon & Legrand, 2021; Dufourneaud & Heffta, 2022).

Against this background, this study examines the extent to which the Process Communication Model (PCM) can serve as a structured pedagogical framework for transversal-skills development within a Power Skills module in the education bachelor's programme “Education and Management of Sport Organisations”. Accordingly, it asks: to what extent does PCM-based instruction support students' transversal-skills development in this programme?

Accordingly, the study pursues one overarching objective: to assess the extent to which integrating a PCM-based training device within a transversal module contributes to the development of transversal skills among students in the “Education and Management of Sport Organisations” education bachelor's programme. The research investigates how five essential competencies which include interpersonal communication, stress management, situational leadership, teamwork and conflict resolution change over time.

Empirically, the study first aims to measure changes in targeted transversal skills between a pre-test and a post-test, in order to provide more objective indicators of the device's potential

impact. It then seeks to document, based on students' learning journals and reflective writings, the perceptions, awareness, and transformations associated with participation in the training, in relation to their personal, relational functioning in educational and sport contexts. A third objective is to bring these qualitative data into dialogue with quantitative results in order to assess the consistency between measured changes and reported subjective experiences.

These methodological choices translate into two research questions structuring the inquiry: (1) What effects does a PCM-based pedagogical device produce on education bachelor's students' competencies in communication, stress management, and leadership? (2) The students demonstrate their understanding of this device through their assessment of its effects on their personal growth and their ability to handle stressful moments and their social connections with peers in their educational and sports activities.

In line with the theoretical framework, two hypotheses guide the evaluation. The first (H1) states that assessment results for transversal skills will show substantial growth from pre-test to post-test times when the PCM-based device activates. The second (H2) predicts that learning journal qualitative data will validate these changes through detailed observations of student communication development, stress management abilities, leadership approaches during their educational and sports activities.

2 Methodology

The research design used a quasi-experimental pre-test/post-test design without a control group together with a convergent mixed-methods approach. The research design aimed to study student transversal skill development through the Process Communication Model (PCM) based intervention by uniting quantitative pre-post test results with qualitative data from student reflective writings during the program. The research design used quasi-experimental methods to monitor student development through their natural classroom learning environment while the convergent mixed-methods design analysed statistical data alongside qualitative assessments of student responses.

The study was conducted with students enrolled in the education bachelor's programme "Education and Management of Sport Organisations" (EMOS) at the École normale supérieure (ENS), Abdelmalek Saâdi University. The professionalising program based at the education-sport management cross point trains students to become supervisors who will coordinate projects in organisations which need staff members to handle complex relationships and emotional work and make important decisions.

The sample comprised 52 EMOS students enrolled during the year of the intervention. The research team used convenience sampling to find participants who made up the entire group of students enrolled in the specific transversal module. The research included participants who enrolled in the Power Skills module which combined PCM with PCM content and who attended all their scheduled classes. For quantitative analyses, students were excluded if they had missed more than two sessions and/or had not completed all data-collection instruments at both pre-test and post-test.

The Power Skills module chapter dedicated to PCM consisted of five organised sessions through which the intervention was delivered. The program combined theoretical PCM education with practical activities through case studies, simulations, role plays and reflective guidance to help participants learn concepts which they could apply to their actual educational and sports work. The intervention structure for each session appears in Table 1 which includes objectives, PCM content, learning activities, targeted skills and expected outputs.

The research investigated how PCM-based intervention affected student development of transversal skills by using two assessment instruments which consisted of (a) criterion-

referenced rubrics for pre-test and post-test assessment and (b) reflective learning journals. The research design uses convergent mixed-methods because it combines quantitative data to measure personal growth with reflective writings which help researchers track information movement between different environments based on the experiential learning theory which defines learning as experience transformation (Kolb, 2015, p. 49).

The assessment framework used a criterion-referenced system which evaluated student performance against established criteria instead of comparing them to their peers. It draws on the literature on rubrics, defined as “a coherent set of criteria for students’ work that includes descriptions of levels of performance quality on the criteria” (Brookhart, 2013, p. 4). The rubric enables users to access specific assessment criteria and performance levels which help them understand the evaluation process and judges can use these standards to maintain consistent evaluation method

Session	Pedagogical objectives	PCM components mobilised	Experiential learning activities	Expected learning outputs / traces
1. Introduction and appropriation of the framework	Understand the purpose of the pedagogical device and appropriate the core concepts; initiate a first self-observation process	General overview of PCM; “perception–communication–stress” logic	Interactive mini-lecture; guided discussion; initial self-positioning; micro-observation situations	Reflective journal 1: expectations, experienced situations, initial observations
2. Personality profiles and perception modes	Identify dominant perception modes and their effects on communication; recognise the diversity of communication styles	Personality types (six profiles); perception modes (facts/opinions/emotions/imagination, etc.)	Self-diagnostic (tool/worksheet); message decoding exercises; dyadic exchanges	Reflective journal 2: “my style / others’ styles,” concrete examples
3. Psychological needs and relational motivation	Identify psychological needs and understand their role in motivation and relational tension	Psychological needs associated with profiles; signals of satisfaction and frustration	Case study analysis; “need–message–reaction” mapping; guided role plays	Reflective journal 3: dominant needs, situations of satisfaction and frustration
4. Stress sequences and regulation strategies	Identify stress triggers and sequences; mobilise appropriate exit and regulation strategies	Stress sequences; distress behaviours; regulation strategies / “exits”	Simulations of high-pressure situations (sports/education); reflective debriefing; individual action plan	Reflective journal 4: stressful situation + analysis + tested strategy
5. Integration, transfer, and consolidation	Consolidate learning outcomes; transfer PCM to professional situations; formalise action guidelines	Synthesis: profiles–needs–channels–stress; principles of adjusted communication	Complex situational exercise (coordination/leadership); collective feedback; final synthesis	Reflective journal 5: overall reflection, perceived changes, transfer plan

Table 1 — Structure of the PCM-based pedagogical device (five sessions)

The assessment tool assesses six operational competencies which align with the module learning targets (self-knowledge, adaptability, stress management, interpersonal Communication, situational leadership and conflict resolution) through particular performance criteria which relate to core PCM principles (communication styles, psychological needs, communication channels and stress sequences) (Kahler, 2008; Kahler & Capers, 1974). The researchers used a four-level ordinal scale which ranged from 1 (not acquired) to 4 (mastered) to show development stages while avoiding excessive segmentation of performance and they tested participants before and after the study to measure individual changes.

The research validated content through two methods which included (1) PCM dimensions received systematic alignment with the specific competencies and (2) expert/teacher review which enhanced the descriptors to become more observable and relevant and clear. The intervention followed active-learning principles through its combination of conceptual input, simulations, role plays and reflective activities. The definition of active learning according to Prince (2004) states that any teaching approach which involves students directly in the learning process qualifies as active learning (p. 223). The learning journals recorded students' self-reported understanding and their communication changes and their stress management techniques which they applied in real classroom situations.

The rubric requires advanced psychometric evaluation to establish its measurement reliability and its internal construct organisation. The research tool functions as a systematic documentation system for pre-test and post-test changes during an exploratory study which takes place in a real classroom environment. The tool needs additional validation studies to become effective in future research.

Transversal Competency	Measurable Behavioural Indicators	Before (1–4)	After (1–4)	Gap
Self-awareness	Identifies their PCM profile and preferred ways of functioning; recognises their dominant needs and motivation.			
Behavioural adaptability	Adapts their communication style to the perceived profiles and needs of others			
Stress management	Identifies their behaviours under stress and implements at least one refocusing technique			
Interpersonal communication	Uses appropriate communication channels (emotion, action, reflection, etc.) to facilitate mutual understanding			
Situational leadership	Mobilises their own profile and those of the team to motivate, organise, and guide a group			
Conflict resolution	Defuses tensions through communication adjusted to the psychological needs of the interlocutors			

Table 2: Criterion-Referenced Evaluation Grid for Soft Skills Based on the Process Communication Model.

Students kept reflective learning journals throughout the intervention period based on the assessment rubric. The reflective practice method in these texts enabled readers to separate their personal experiences from practical knowledge acquisition according to Schön who states that practitioners depend on reflection-in-action to manage practice situations which differ from standard cases (Schön, 1983/1984, p. 70). The journals contained evidence which researchers used to document students' reported learning progress and their identification of important situations and their perceived changes from the intervention. The method applies experiential learning principles which describe learning as a process that transforms personal experiences into new knowledge (Kolb, 1984, p. 41). The participants needed to finish their journal entries following each session through prompts which directed their responses to specific topics. The journal prompts required participants to report their experienced situations which included communication and stress events and their application of PCM concepts and their encountered challenges with their attempted solutions and their observations about how these changes affected their academic and athletic activities.

Rubric data were analysed to describe levels of transversal skills at the two measurement points (pre-test/post-test) and to examine within-person change. The researchers calculated descriptive statistics which included mean values and standard deviation values for each competency at both pre-test and post-test assessment points. The researchers conducted an exploratory analysis of both score distributions and pre-test to post-test difference patterns. Pre/post differences were then tested using paired-samples t-tests, and the magnitude of change was estimated using Cohen's d effect size (Cohen, 1988). The study used $\alpha = .05$ as its statistical significance threshold. The research team handled missing data through a protective approach which involved analysing only participants who completed both pre-test and post-test assessments for each competency. The research team documented all missing data points which they presented in the results section.

Learning journals, completed online, were exported and compiled into a single anonymised corpus (identifiers such as E01, E02...), organised by session. The research team conducted inductive thematic analysis on the collected data which Braun and Clarke (2006) describe as a method to discover and study recurring patterns (themes) in research data (p. 79). The research analysis followed a sequential method which started with complete text comprehension to find meaningful parts followed by open coding of segments about awareness, difficulties, adjustments, perceived effects, then code grouping into categories and finally theme development from these categories. The research team discussed emerging categories with their peers to minimise interpretation errors which helped establish the coding system. The final themes united PCM-related information (profiles, needs, channels and stress sequences) with the common skills which students needed to develop (communication, cooperation, leadership and tension regulation). The themes allowed students to share any additional points they wanted to discuss.

Finally, qualitative findings were used to enrich the interpretation of quantitatively measured changes (an interpretive enrichment logic rather than "cross-validation"). The research team analysed competency area statistical data with qualitative results to determine specific participant changes while assessing their development through pre-to-post assessment journal entries.

3 Results

The quantitative results focus on changes in transversal skills assessed using the criterion-referenced rubric administered before (pre-test) and after (post-test) the implementation of the pedagogical intervention based on the Process Communication Model. Analyses relied on within-person comparisons conducted with the 52 students who had complete data at both measurement points.

Table 3 presents, for each of the six assessed competencies, pre-test, post-test means and standard deviations, the mean change (ΔM), the paired-samples *t* statistic, the level of statistical significance, and the effect size estimated using Cohen's *d*.

Skills	Pre-test M $\pm$ SD	Post-test M $\pm$ SD	ΔM	t(51)	p	Cohen's d
Self-awareness	2.41 $\pm$ 0.49	3.05 $\pm$ 0.46	0.64	8.72	< .001	1.21
Behavioural adaptability	2.36 $\pm$ 0.50	2.90 $\pm$ 0.48	0.54	7.10	< .001	0.98
Stress management	2.28 $\pm$ 0.55	2.75 $\pm$ 0.52	0.47	6.25	< .001	0.87
Interpersonal	2.62 $\pm$ 0.47	3.03 $\pm$ 0.45	0.41	6.02	< .001	0.83

Skills	Pre-test M $\pm$ SD	Post-test M $\pm$ SD	ΔM	t(51)	p	Cohen's d
communication						
Situational leadership	2.44 $\pm$ 0.52	2.92 $\pm$ 0.50	0.48	6.58	< .001	0.91
Conflict resolution	2.31 $\pm$ 0.56	2.70 $\pm$ 0.54	0.39	5.18	< .001	0.72

Table 3: Changes in Transversal Skills Between Pre-test and Post-test (N = 52)

Analyses indicate a statistically significant increase in mean scores for all assessed transversal skills between pre-test and post-test ($p < .001$ for all dimensions). Within a pre-test/post-test design, this significance suggests that the observed differences are unlikely to reflect random fluctuations and points to systematic within-person change following the pedagogical intervention.

Beyond statistical significance, interpretation is strengthened by considering the magnitude of change, documented here through the mean change (ΔM) and effect size (Cohen's *d*). In this respect, results show not only an overall improvement but also a differentiated pattern of change across competencies.

Self-knowledge shows the greatest enhancement among all the measured aspects ($\Delta M = 0.64$; $d = 1.21$). This large effect size indicates a substantial change, since, as Cohen notes, " $d = 0.2, 0.5, 0.8$ may be regarded as small, medium, large" (Cohen, 1988, p. 25). The scores moved toward the "acquired" level because the results show a rise from 2.41 to 3.05. The observed pattern follows the intervention design because PCM requires participants to discover their personal characteristics and mental requirements and regular behavioural patterns which should produce quick improvements in self-awareness indicators (Kahler, 2008; Kahler & Capers, 1974).

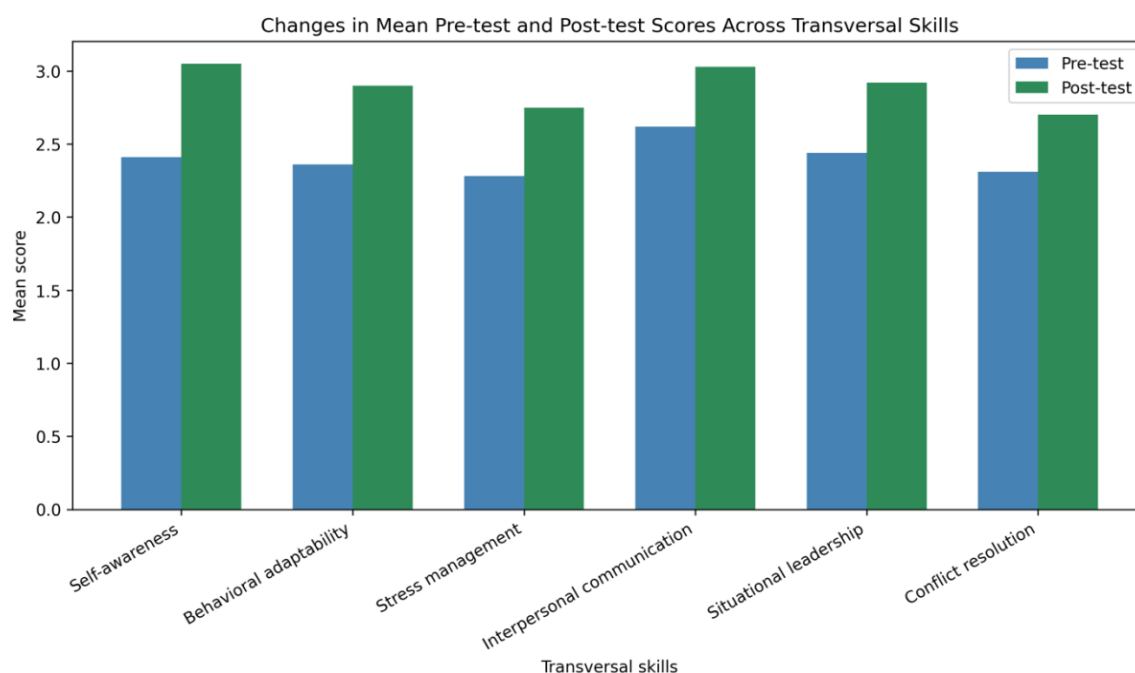


Figure 1: Changes in Mean Pre-test and Post-test Scores Across All Transversal Skills Assessed Using the Process Communication Model-Based Grid

The research data indicates that participants learned to adapt their behaviour through a 0.54 point increase ($d = 0.98$) and their situational leadership competencies improved by 0.48 points ($d = 0.91$). The research showed that participants learned to change their communication approaches and actions through their dialogues with others and their environment while they acquired social signal understanding which resulted in enhanced group work performance. People who understand themselves better will develop better adaptation skills because their self-knowledge helps them create better changes to their preferences. Leadership development seems to emerge from people who learn to control group environments through their improved communication abilities and regulatory skills (Kahler, 2008).

Stress management ($\Delta M = 0.47$; $d = 0.87$) and interpersonal communication ($\Delta M = 0.41$; $d = 0.83$) also increase significantly, with large effect sizes. The program which focuses on education and management needs these changes because supervisors need to maintain effective relationships while handling workplace conflicts. The communication group achieved a slightly lower mean improvement rate because their initial scores were higher which limited their ability to show rapid progress.

The final result shows that conflict resolution produces a moderate-to-large effect size which reaches a level of ($\Delta M = 0.39$; $d = 0.72$). The performance improvement became possible because the competency required multiple practice sessions and real-world field experience instead of quick learning of theoretical signal principles. The profile of change shows a logical pattern because the intervention produced its most significant improvements in abilities which directly relate to its fundamental operations (self-knowledge, adaptability and leadership). The intervention produced significant improvements in self-knowledge and adaptability and leadership competencies but it also led to moderate improvements in conflict resolution abilities which depend on specific contextual factors.

The research team conducted inductive thematic analysis of learning journals to identify three core themes which explained student learning experiences and their social transformations and their self-assessed personal growth. The research method of thematic analysis consists of identifying, analysing and reporting data patterns which Braun and Clarke (2006) describe as

themes (p. 79). The analysis presents Table 4 which contains two sections that show (a) the occurrence of themes in the corpus and (b) examples of student PCM application through their use of interlocutor speech and psychological needs and taking time to reflect. The reported frequencies demonstrate the relative significance of themes but they do not include all possible occurrences.

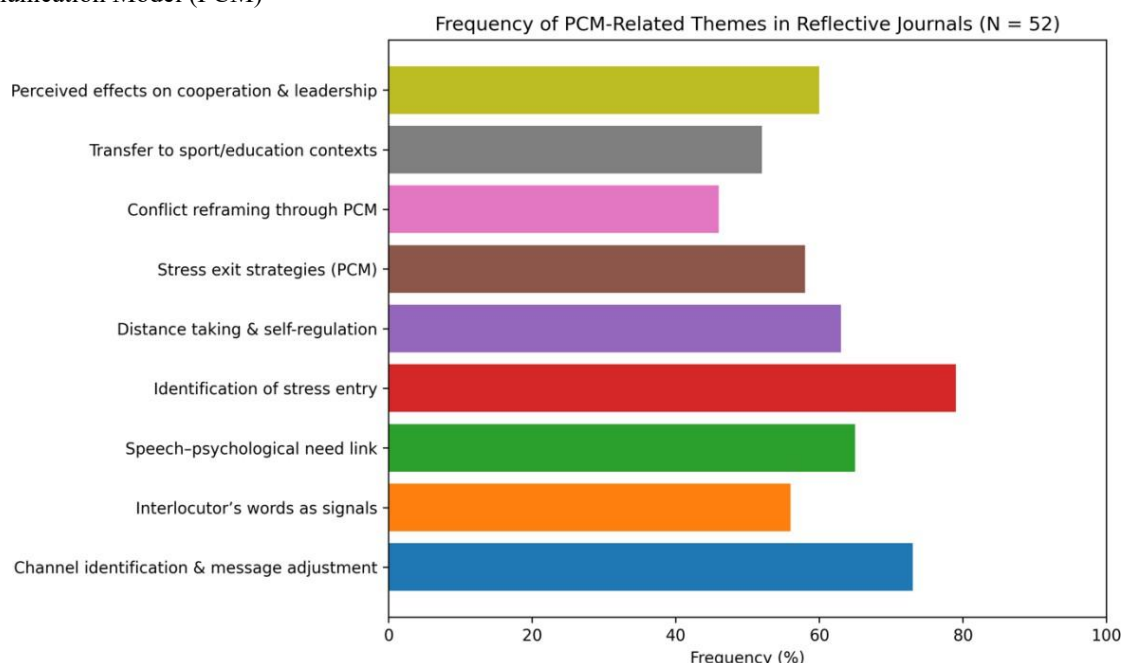
Theme (PCM)	Targeted Indicators (PCM cues)	Frequency (n / %)	Verbatim 1	Verbatim 2
Identification of communication channel and message adjustment	Reference to a communication channel (directive / interrogative / nurturing / playful), message adjustment	38 / 73%	"I stopped using a directive tone and shifted to an interrogative one to clarify the situation."	"Using a nurturing channel helped calm the discussion more quickly."
Interlocutor's words as signals	Quotation of the interlocutor's exact words combined with emotional or behavioural impact	29 / 56%	"When he said 'you never understand,' I felt the tension rise."	"She kept repeating 'be clear,' and I realised my instructions lacked structure."
Link between speech and psychological need	Explicit connection to a psychological need (structure / contact / recognition, etc.)	34 / 65%	"I needed recognition for my work; when I didn't get it, I started over-controlling."	"Her need for contact was strong, so I adopted a more reassuring tone."
Identification of stress entry	Identification of a stress sequence (over-control, withdrawal, etc.)	41 / 79%	"Under stress, I wanted to control everything and kept interrupting others."	"I withdrew and stopped participating when the pressure increased."
Taking distance and self-regulation	Pause, distancing, breathing, reformulation, self-observation	33 / 63%	"I took ten seconds, breathed, and then reformulated calmly."	"Instead of responding immediately, I observed my reaction before speaking."

Theme (PCM)	Targeted Indicators (PCM cues)	Frequency (n / %)	Verbatim 1	Verbatim 2
Stress exit strategies (PCM)	Concrete action: asking for structure, seeking contact, withdrawing, etc.	30 / 58%	"I asked for a clear framework: objectives, timing, and roles."	"I changed activities to restore my energy and avoid provocation."
Reframing a conflict through PCM	Conflict explained by unmet needs, inappropriate channel, or stress response	24 / 46%	"The conflict mainly stemmed from an unmet need for structure on his part."	"I realised I had entered a stress state and that my communication channel was no longer appropriate."
Transfer to sport/educational contexts	Application in field settings (training, facilitation, events)	27 / 52%	"During training, I adapted my instructions to the profile, and the group followed."	"In facilitation activities, I managed tension better by changing how I communicated."
Perceived effects on cooperation and leadership	Cohesion, coordination, adaptive leadership, tension prevention	31 / 60%	"I distributed roles more effectively, and the team became calmer and more organised."	"My leadership became less authoritarian and more situational, depending on the individuals."

Table 4: PCM Themes, Textual Indicators, Simulated Frequencies, and Verbatim Excerpts

Analysis of the learning journals highlights transformations that are primarily reflective, relational, and regulatory in nature, thereby clarifying the meaning of the changes observed in the quantitative findings. The identified themes point less to the mere acquisition of theoretical knowledge than to a gradual shift in how students perceive, interpret, and regulate their interactions, particularly in educational and sport contexts characterised by relational pressure.

Figure 2. Frequency of Themes Identified in Reflective Journals According to the Process Communication Model (PCM)



The research produced two main results which showed participants developed better understanding about their own operational methods (Figure 2). Students described how they started to view communication situations differently because they now linked their responses to psychological requirements and their preferred ways of perceiving and communicating. The new interpretation method enables better comprehension of stress reactions which produces mental clarity that supports the PCM-based intervention targets.

The journals show students who identified their stress triggers which included word choice, message tone and communication method. People now focus more on detecting social signals which aligns with their adoption of PCM reference points that connect messages to unmet needs and stress entry points. People now read situations functionally instead of acting immediately.

Students discovered another vital aspect about their distance creation abilities and rule compliance through their description of stopping their thoughts before answering. The accounts show how people move from using a defensive response to developing a more thoughtful approach which could help them in their professional work under stressful conditions.

The research findings about communicational adjustment themes support the observed pattern. Students described their intentional changes between words and tone and communication approaches which they based on their ability to understand what the other person needed. The system tested different methods through experimental procedures which resulted in sequential improvements that followed human development patterns for relational competencies in specific situations. The research findings showed that students believed their

cooperative work and leadership abilities received positive effects from the journaling activity. Students reported that their posture became more attentive because they learned to observe their group members' individual characteristics and requirements. The research data showed that tension and conflict management themes appeared rarely but they provided valuable insights about the subject. The research participants started to view conflicts as communication breakdowns which also involved unfulfilled psychological requirements which led them to create specific intervention plans.

The qualitative research findings show that the PCM-based device serves as an educational tool which helps students build their self-perception skills and their ability to understand others through a step-by-step learning process. The process seems to create two effects which start with better understanding of body functions and how they work together before leading to changes in behaviour. The quantitative results show consistent patterns when analysed with the qualitative data. The rubric shows the greatest improvement in competencies which include self-knowledge, adaptability and leadership abilities. The students demonstrate their understanding of the model through their classroom work and their application of the model in different learning environments. The numerical results from quantitative data become more meaningful through qualitative data which demonstrates how competencies function in actual workplace environments.

The analysis contains vital data which needs to be evaluated. The journals showed that students learned at different rates while achieving various academic goals which became difficult to maintain because students needed to handle their stress and conflicts during their most emotional periods. Such interpretation is consistent with thematic analysis, defined as a method for “identifying, analysing, and reporting patterns (themes) within data” (Braun & Clarke, 2006, p. 79). The journals show that PCM users select their own methods which they apply to their practice. The students demonstrated different levels of adoption for the model's terminology and methods because some students learned them rapidly but others applied them in a simplified way.

The qualitative data indicates students learn at varying rates while developing their transversal competencies which reveals their small distinct characteristics. Tensions between the two strands of findings also appear. The situational leadership assessment results show high scores but participants share stories about their lack of self-assurance and their challenges to take charge and their ongoing struggle to gain acceptance from their actual group members. The assessment of conflict resolution skills produced a large amount of qualitative data which showed students learned vital competencies which they continue to develop. The observed patterns indicate that effect sizes function as indicators which show change depth but researchers should view them through the lens of developmental processes.

Research data shows that students can develop their transversal competencies through PCM-based teaching methods which help them identify connections between different developmental stages. The criterion-referenced rubric enables us to identify general patterns but the learning journals show how students learn through their appropriation processes and their attempts at learning and their regulatory activities. The dialogue enables interpretation through independent analytical methods which prevent strict mixed-methods triangulation by showing how developed competencies can be used in actual educational and sport settings.

4 Discussion

The findings provide convergent answers to the two research questions. The pre-test/post-test analysis shows that the PCM-based pedagogical intervention leads to significant improvements in all assessed transversal skills ($p < .001$) which supports the expected positive effects of the intervention on individual students. The learning journals show how participants developed their self-awareness and their ability to handle stressful situations, their communication skills in educational, sports environments and their interactions with others beyond classroom hours. The research findings demonstrate that participants achieved significant score improvements between their pre-test and post-test assessments which supports H1. The reflective writings help explain the reported changes but they do not perform strict mixed-methods triangulation according to H2.

The interpretation process benefits from fundamental theoretical principles which PCM provides. Self-knowledge shows the most significant growth because it follows the model which aims to identify individual characteristics and challenges that result in fast changes in self-observation and self-regulation measurements (Kahler, 2008; Kahler & Capers, 1974). The principle of PCM which states that channels and messages need to match how people perceive things and their psychological requirements helps explain how to improve behavioural flexibility, social interaction skills and leadership abilities in different situations (Kahler, 2008). The journals reveal these mechanisms by showing how people change their messages and switch between different communication methods and their efforts to stop conflicts from growing worse in social groups (Collignon & Legrand, 2021; Dufourneaud & Heffta, 2022). The educational value of PCM matches the research evidence which Gilbert (1996) showed about its usage in educational leadership.

The study results validate earlier studies about transversal skills and work readiness because employers need both technical abilities, communication skills, teamwork competencies and flexibility (Andrews & Higson, 2008; Succi & Canovi, 2020). Research in labour economics demonstrates that social abilities lead to better job performance when employees need to collaborate with others and tackle intricate problems (Deming, 2017). The current school evaluation systems do not assess non-cognitive skills because these abilities predict students' future academic and professional success (Heckman & Kautz, 2012). The OECD focuses on policy development through their work which defines cognitive abilities and socio-emotional competencies (OECD, 2018) yet they confirm that current assessment methods fail to produce reliable and equivalent measurements of transferable skills thus requiring specific frameworks and assessment tools (Thornhill-Miller et al., 2023).

The research results match previous studies about active learning and experiential learning according to pedagogical principles. The definition of active learning according to Prince (2004) states that it includes any teaching approach which makes students participate in their educational process (p. 223) and this definition matches the intervention structure which includes cases and simulations and role-plays. The module benefits from experiential learning because Kolb (2015) shows that people learn through their direct experiences which they convert into new knowledge (p. 49). The module uses an experience–reflection–conceptualisation cycle to support experiential learning which proves to be an effective learning approach. The practice of reflective work enables professionals to create methods which help them understand written documentation's role in knowledge development during their learning process of professional method adaptation (Schön, 1983).

The research provides value through its analysis of professional development skill changes which occur during an actual training program and its development of a method to connect practical learning to reflective practice. The study holds institutional value because

international assessments of Moroccan skills and employment needs demonstrate that the country needs to enhance its educational pathways which lead workers to employment opportunities (World Bank, 2020). The research findings need to be evaluated through the lens of existing study restrictions because the study lacks a control group for establishing cause-and-effect relationships. The research depends on student self-assessment for its measurements because these indicators lack complete objectification. The study's results about long-term effects and maintenance period remain uncertain because of its small participant number and brief intervention period. The learning journal results depend on students' willingness to write and their choice of which situations to include in their reports.

The current study has several research limitations which need to be addressed through future investigations. The research should use comparative designs which include a control group and PCM against another model to enhance the ability to establish cause-and-effect relationships. The study should track participants from the beginning to the end of six months to study how well the program maintains its effects and how well participants apply their learned skills to their internships and supervision roles. The assessment process should use multiple evaluation methods which include peer reviews, mentor feedback, internship supervisor assessments and when possible direct observations of real-world situations. The study should enhance its measurement methods by using the criterion-referenced rubric together with performance-based assessments which receive ratings based on established criteria and formalised evaluation methods. The research design enables scientists to identify when PCM generates superior results for professional development programs which concentrate on coordination and interaction management.

5 Conclusion

This study examined the extent to which integrating a pedagogical intervention grounded in the Process Communication Model (PCM), within a transversal “Power Skills” module, is associated with the development of transversal skills among students enrolled in the Education degree programme “Education and Management of Sports Organisations.” Findings from a pre-test/post-test design, complemented by the analysis of reflective learning journals, indicate statistically significant positive changes across all targeted competencies— particularly self-knowledge, behavioural adaptability, stress management, interpersonal communication, situational leadership, and conflict resolution.

The central takeaway is that PCM, when implemented not as a stand-alone personal development tool but as a structured pedagogical intervention embedded in a university curriculum and articulated with experiential and reflective practices, provides a relevant framework for supporting measurable development of transversal skills in a professionalising training context. The observed gains suggest that key PCM components—profile identification, clarification of psychological needs, recognition of stress sequences, and adjustment of communication channels—may enhance self-understanding and strengthen relational adaptation in complex educational and sport settings. From an operational standpoint, several recommendations can be drawn. First, the results support the case for explicit, credit-bearing curricular integration of transversal-skills development initiatives, in line with institutional orientations toward the professionalisation of university programmes. Embedding dedicated modules such as Power Skills can move beyond fragmented or peripheral approaches to soft skills by positioning them as a core part of learning pathways.

Second, the study highlights the value of combining criterion-referenced assessment tools with reflective supports to document both measurable change and underlying learning processes. Rubrics grounded in explicit criteria and anchored in an identified conceptual

framework can enhance the transparency and coherence of transversal-skills assessment while providing students with concrete benchmarks for improvement. In addition, linking the intervention more closely to internships, supervised projects, and authentic professional situations appears particularly promising. Journal entries written outside class suggest that students mobilised PCM concepts across diverse interactional contexts, notably in sport and educational settings. This continuity between academic learning and field experience could be strengthened through structured mentoring arrangements that include guided reflective debriefings involving instructors, internship supervisors, and students.

Finally, beyond the specific EMOS programme, this study offers a transferable prototype of a pedagogical intervention that could be adapted to other higher-education programmes facing comparable relational, managerial, and emotional demands. In this respect, it contributes to ongoing discussions about how higher-education reforms can be operationalised by demonstrating that structured, evaluable interventions targeting transversal skills can be designed, implemented, and assessed within authentic training environments.

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