INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH AND INNOVATIVE STUDIES
ISSN: 2820-7157
www.ijsrisjournal.com

April 2026 Volume 5 Number 2 273-279

Received Date: 22 February 2026 Accepted Date: 14 March 2026 Published Date: 2 April 2026

A Comparative Analysis of Perceptions of the Outcome-Based Approach and the Competence-Based Approach in Nursing Education in Mbandaka, DRC: An Analysis of the Determinants of Teacher Adherence

MALOMBE MUKAMBA Dieudonne [1], Prof. TSHITADI MAKANGU Augustin [2], CT. NYAFE BASELE Henry [3], BOSAKO MANGA Tonton [4]

1. Higher Institute of Medical Techniques, Équateur, DRC (Research student), https://orcid.org/0009-0003-2213-5192, dieudonnemalombe@gmail.com
2. Research Department, ISTM/KISHASHA (Director), maxebg@yahoo.fr
3. Tropical Health Research Unit, ISTM Mbandaka (Supervisor), https://orcid.Org/0009-0008-0919-4653 , henrinyafé@gmail.com
4. Research Department, ISTM Mbandaka, https://orcid.org/0009-0006-8553-3456 , mangatoms@gmail.com

Abstract

Background: The Democratic Republic of the Congo has recently adopted the Bachelor's-Master's-Doctorate (LMD) system, requiring a pedagogical transition from the Objective-Based Approach (OBA) to the Competence-Based Approach (CBA). This transition faces severe structural constraints in peripheral medical training institutions.

Objective: To compare the perceived effectiveness of the OBA and the CBA for patient safety and to identify factors associated with staff adherence to the reform.

Methods: A cross-sectional analytical survey was conducted among 50 teachers (84% men, 62% lecturers) at ISTM-Mbandaka. A 4-point Likert scale questionnaire measured perceptions. Analyses included logistic and linear regression, hierarchical clustering (Ward) and correspondence analysis.

Results: 72% of respondents preferred APC for patient safety. LMD training increased the probability of adopting APC by a factor of 3.5 (OR=3.49; 95% CI [1.21–10.05]; p=0.02). The lack of laboratories (mean=3.44), overcrowded placements (mean=3.48) and unreliable internet connection (β=-0.31; p=0.019) are the main obstacles. Seniority exerts a negative moderating effect (β = −0.26; p = 0.049). An oppositional typology distinguishes a pro-APO cluster (untrained seniors) from a pro-APC cluster (trained young people).

Conclusion: Despite strong support in principle for the competency-based approach, infrastructure and digital deficits hinder its effective implementation. A strategic plan incorporating compulsory training, low-threshold laboratories and hybrid connectivity is recommended.

Keywords: Competency-based approach, medical training, patient safety, LMD, Mbandaka, digital divide.

1. Introduction

The educational reform introducing the Competency-Based Approach (CBA) into the Bachelor's-Master's-Doctorate (LMD) system marks a major turning point for higher education in the Democratic Republic of the Congo (MESU, 2018). Unlike the Objective-Based Approach (OBA), which prioritises the achievement of decontextualised behavioural objectives, the CBA aims to develop integrated skills that can be applied in complex situations, particularly clinical ones (Roegiers, 2016).

In the medical field, this transition is crucial: patient safety depends heavily on the ability of healthcare professionals to manage the unexpected and to apply knowledge in real-world contexts (Frenk et al., 2010). However, in peripheral Congolese training institute, the implementation of APC faces major obstacles: a shortage of simulation laboratories, overcrowding at hospital placement sites, unstable internet connections, and a lack of pedagogical training for teachers (Mubalama & Nzita, 2019).

To date, no study in Mbandaka (Equateur Province) has quantified teachers' comparative perceptions of APO and APC, nor identified the factors predicting their support for the reform. This research fills this gap by addressing three questions: (1) Which approach do teachers consider most conducive to patient safety? (2) What are the infrastructural and digital barriers to APC? (3) Do LMD training, seniority or academic rank influence these perceptions?

2. Methods

2.1. Study design and framework

This is an analytical cross-sectional survey conducted between September and October 2025 at the Institut Supérieur des Techniques Médicales (ISTM) in Mbandaka, Équateur Province, DRC. The institution trains paramedical staff in three departments (Nursing, Midwifery, Others).

2.2. Population and sampling

The target population comprised 87 permanent and regular part-time teaching staff. A simple random sample of 50 subjects was drawn (Schwartz formula: $n = [Z^2 \times p \times (1-p) \times N] / [e^2 \times (N-1) + Z^2 \times p \times (1-p)]$; with Z=1.96, p=0.50, e=0.08, N=87). The inclusion criteria were: ≥1 year's seniority, teaching in a clinical department, signed consent. Teachers on extended leave and incomplete questionnaires (>30% missing) were excluded.

2.3. Data collection instrument

A self-administered paper-based questionnaire comprising 18 items was developed, structured into four sections: (A) sociodemographic characteristics; (B) training under the BSc-MSc system; (C) comparative perception of APO vs APC (4-point Likert scale: 1=strongly disagree to 4=strongly agree); (D) open-ended questions. Content validity (CVI=0.86) was established by three experts. Internal consistency (Cronbach's α=0.81 for section C) is satisfactory.

2.4. Statistical analyses

The data were analysed using SPSS v26 and Python (scikit-learn). Three levels of analysis were conducted: (1) descriptive (frequencies, means, standard deviations); (2) bivariate (Student's t-test, ANOVA, Chi-square, Fisher's exact test, Pearson's correlation); (3) multivariate (binary logistic regression, stepwise multiple linear regression, correspondence analysis, ascending hierarchical clustering – Ward's method). The α threshold was set at 0.05.

2.5. Ethical considerations

The study was approved by the ISTM-Mbandaka Management Committee. All participants signed an informed consent form. Anonymity and confidentiality were guaranteed (no personal data).

3. Results

3.1. Sample characteristics

The sample of 50 teachers is predominantly **male (84%)** and consists mainly of **teaching assistants (62%)**. More than half of the respondents (**56%**) have less than 10 years' experience, and the **Nursing** section is the most represented (68%). One critical point emerges from these data: **64% of respondents have received no training** in the BSc-MSc-PhD system.

Table 1: Sociodemographic and academic breakdown of participants (n=50)

Variable	Category	Sample size (n)	Percentage (%)
Gender	Male	42	84
	Female	8	16
Rank	Assistant	31	62
	Site Manager	15	30
	Lecturer	4	8
Seniority	0–10 years	28	56
	11–20 years	15	30
	> 20 years	7	14
Section	Nurse	34	68
	Midwife	4	8
	Other	12	24
Bachelor's degree	Yes	18	36
	No	32	64

Comment: The sample reflects the predominantly male and relatively young composition of the teaching staff at peripheral ISTMs. The high proportion of teachers not trained in the BSc-MSc system (64%) constitutes a major weakness for the implementation of the Competence-Based Approach (CBA).

3.2. Comparative perceptions of the two pedagogical approaches (APO vs APC)

Teachers' perceptions were assessed using a Likert scale ranging from 1 to 4.

Table 2: Average scores for items relating to APO and APC

Item (indicators)	n	Mean	Standard deviation
APO: Mastery of theoretical foundations	50	3.04	0.92
APC: Student trainee's autonomy	50	3.2	0.85
APC: Strengthening interdisciplinarity	50	3.18	0.79
APO: Speed of assessment	50	3.12	0.88
APC: Lack of laboratories (barrier)	50	3.44	0.9
APC: Overwork (obstacle)	50	3.31	0.78
APO: Difficulty dealing with the unexpected (weakness)	50	3.16	0.87
APC: Insufficient command of tools (portfolio)	50	3.22	0.84

Comment: All items (indicators) score an average above 3, indicating overall agreement with the statements. Infrastructure-related obstacles linked to the APC (notably the lack of laboratories, with an average of **3.44**) are highlighted most strongly, revealing a keen awareness of the material constraints hindering the pedagogical transition.

3.2. Perception of external barriers and safety

The transition to the Competency-Based Approach (CBA) is influenced by structural and ethical factors, notably the management of student flows and patient safety.

Table 3: External obstacles and patient safety

Item (indicators)	n	Mean / %	Standard deviation
Capacity of supervised placement sites (Item 13)	50	3.48	0.76
Preference for patient safety (**APC** vs APO)	50	72%	—

Comment: Nearly three-quarters of teachers (72%) believe that APC offers a better guarantee of patient safety. Paradoxically, overcrowding at clinical placement sites represents the most serious external threat identified by respondents (average of 3.48/5).

3.3. Bivariate analysis: associations with preference for APC

Cross-tabulation analysis identifies the variables influencing support for APC, notably pedagogical training and experience.

A. Impact of the LMD programme

Table 4 demonstrates the decisive influence of initial training on pedagogical choices.

Table 4: Cross-tabulation of LMD training received and preference for the APC

LMD training	Prefer APC	Prefer APO	Total	p-value*
Yes (n=18)	16 (88.9%)	2 (11.1%)	18	**0.02**
No (n=32)	20 (62.5%)	12 (37.5%)	32	
Total	**36 (72%)**	**14 (28%)**	**50**	

**Fisher's exact test*

Comment: There is a statistically significant association ($p=0.02$) between having received LMD training and a preference for the APC. Trained teachers are significantly more likely to favour the APC (88.9%) than their untrained colleagues (62.5%).

B. Influence of seniority on the perception of barriers

Table 5 explores the link between professional experience and the perception of workload.

Table 5: Correlation: Seniority vs Perception of excessive workload (Item 6)

Length of service	N	Mean (Item 6)	Standard deviation	Pearson's r	p-value
0–10 years	28	3.21	0.83	0.32	0.02
11–20 years	15	3.4	0.74		
20+	7	3.57	0.53		

Comment: A weak but significant positive correlation is observed ($r=0.32$; $p=0.02$). This result indicates that the longer a teacher has been in the profession, the more they perceive excessive teaching hours as a major obstacle to the personalised support required by the APC.

C. Digital divide and self-directed learning

Table 6 highlights a significant disparity in the use of technological tools to engage with the APC.

Table 6: Comparison of access to digital resources by length of service

Seniority group	N	Mean (Access)	Standard deviation	t	p-value
Young people (< 10 years)	22	**3.21**	0.89	2.41	**0.02**
Seniors (aged 10 and over)	28	2.91	0.92		

Comment: Teachers with less than 10 years' experience agree significantly more than their more senior colleagues that access to digital technology facilitates self-directed learning in ICT (p=0.02). This result reveals the existence of a **generational digital divide** within the institution.

3.4. Multivariate analyses

A. Predictors of preference for APC

A binary logistic regression was carried out to identify the factors determining the choice of APC over APO.

Table 7: Binary logistic regression: Predictors of the choice of APC

Variable	B	E.S.	Wald	p-value	OR	95% CI
Grade (Ref. Assistant)						
Site Manager	0.42	0.51	0.68	0.41	1.52	[0.56–4.12]
Professor	1.1	0.78	1.99	0.16	3	[0.65–13.85]
Length of service	0.03	0.04	0.56	0.45	1.03	[0.95–1.12]
Bachelor's degree (Yes)	1.25	0.55	5.16	0.02	3.49	[1.21–10.05]
Lack of laboratories (Item 5)	-0.62	0.35	3.14	0.08	0.54	[0.27–1.08]
Constant	-0.87	1.12	0.6	0.44	0.42	—

Nagelkerke R^2 = 0.31; Correct prediction rate = 78%

Comment: LMD training is the only highly significant predictor (p=0.02). A teacher trained in the LMD system is **3.5 times more likely** to prefer the APC. Conversely, a lack of laboratories tends to hinder this adoption (p=0.08).

B. Predictors of the overall adoption score

The multiple linear regression model identifies the variables influencing the intensity of adoption of the APC.

Table 8: Multiple linear regression (Adherence score)

Predictor	Standardised β	t	p-value	VIF
Gender (Female = 1)	0.11	0.85	0.4	1.1
Length of service (years)	-0.26	-2.01	0.049	1.24
Bachelor's degree obtained	0.34	2.64	0.011	1.18
Student financial insecurity	-0.19	-1.45	0.15	1.3
Internet instability	-0.31	-2.42	0.019	1.22

Adjusted R^2 = 0.36; $F(5,44)$ = 6.28; $p < 0.001$

Comment: The model explains 36% of the variance. Adoption is promoted by the **LMD training** (β=0.34), but is significantly hindered by **internet instability** (β=-0.31) and **long service** (β=-0.26). The local digital divide in Mbandaka therefore constitutes a major structural barrier.

3.5. Teacher typology

A hierarchical classification (Ward's method) identified three typical profiles.

Table 9: Typology of teacher profiles

Cluster	Profile	Number (n)	Main characteristics
1	Pro-APO	18	Seniors (>15 years), not trained in the LMD system, attached to the APO.
2	Pro-APC	24	Young people (<10 years old), educated under the LMD system, in favour of the APC.
3	Undecided	8	Mixed profiles, unclear stance on patient safety.

Cophene coefficient = 0.82 (Excellent classification quality)

Final comment: A generational and educational divide pits the 'traditional pole' (Cluster 1) against the 'modern pole' (Cluster 2). This contrast demonstrates that acceptance of change is primarily mediated by the **provision of appropriate educational training**.

4. Discussion

4.1. A principled support for APC thwarted by material constraints

The 72% of teachers who prefer APC for patient safety are consistent with the findings of Roegiers (2016) and Altet et al. (2018) in other French-speaking African contexts. However, this support is severely limited by the lack of simulation laboratories (average 3.44) and the saturation of hospital placements (average 3.48). These results confirm the observations of Frenk et al. (2010) that APC fails in disadvantaged settings due to a lack of 'clinical training infrastructure'.

4.2. LMD training as a key driver of change

Logistic regression shows that LMD training is the only significant predictor of participation in the APC (OR=3.49; p=0.02). This result reinforces the conclusion of Desjardins et al. (2017) regarding the importance of continuing professional development for teachers in the success of pedagogical reforms. The fact that 64% of respondents had received no formal training in the LMD places ISTM-Mbandaka in a vulnerable position, similar to that documented by Ndabaga (2020) in Kivu.

4.3. Seniority: a moderate but real obstacle

Contrary to the hypothesis of widespread resistance from older teachers, the study shows a weak positive correlation between seniority and the perception of excessive workload (r=0.32; p=0.02). This result qualifies the conclusions of Mukendi (2018) and aligns with the framework of Hargreaves (2005): experienced teachers do not offer ideological resistance, but rather a pragmatism linked to the day-to-day feasibility of the APC.

4.4. The digital divide as a novel moderator

The instability of the internet connection significantly reduces adherence to CPD (β=-0.31; p=0.019), an original finding in the literature on CPD in Central Africa. As highlighted by Cook et al. (2011), medical CPD increasingly relies on digital resources (clinical databases, virtual simulations). In Mbandaka, the lack of reliable fibre-optic connectivity creates a double disadvantage: it hinders teachers' self-directed learning and limits access to up-to-date teaching resources.

4.5. Methodological limitations

Five limitations should be considered: (1) small sample size (n=50); (2) single-centre design; (3) social desirability bias (possible overestimation of adherence to PBL); (4) lack of direct measurement of teaching practices; (5) cross-sectional design. However, the convergence of the results with other studies conducted in sub-Saharan Africa suggests a degree of external validity.

5. Implications for practice and research

Three strategic recommendations emerge:

1. Compulsory, certified training for the 64% of teachers not trained in the LMD system, with a practical component on designing complex scenarios and the use of portfolios.

2. Investment in low-tech simulation laboratories (local materials, standardised scenarios) and in hybrid connectivity (shared satellite router).

3. Tripartite agreements between the ISTM, referral hospitals (HGR Wangata) and the provincial Ministry of Health to regulate the flow of trainees.

Future research should include a longitudinal study measuring changes in the actual clinical skills of students trained in APC versus APO, as well as an ethnographic investigation into the 'teaching improvisations' of teachers in a context of staff shortages.

6. Conclusion

In an environment characterised by a shortage of laboratories, digital instability and overcrowded clinical placement sites, the majority (72%) of teachers at ISTM-Mbandaka support APC as a guarantee of patient safety. Training in the LMD system is the main driver of this transition, whilst seniority and the digital divide act as moderating factors. An integrated strategic plan – compulsory training, low-threshold laboratories, tripartite agreements, hybrid connectivity – is needed to transform this commitment in principle into effective clinical skills.

References

1. Altet, M., Charlier, É., Paquay, L., & Perrenoud, P. (2018). Training Professional Educators. De Boeck Supérieur.

2. Cook, D. A., Hatala, R., & Brydges, R. (2011). Technology-enhanced simulation for health professions education. JAMA, 306(9), 978–988.

3. Desjardins, J., Daele, A., & Sylvestre, E. (2017). Metacognition and teacher training. Revue des Sciences de l'Éducation, 43(2), 45–69.

4. Field, A. (2018). Discovering statistics using IBM SPSS statistics (5th ed.). Sage.

5. Fortin, M. F. (2018). Foundations and stages of the research process (4th ed.). Chenelière Éducation.

6. Frenk, J., Chen, L., Bhutta, Z. A., et al. (2010). Health professionals for a new century. The Lancet, 376(9756), 1923–1958.

7. Hargreaves, A. (2005). The changing nature of teaching. Presses de l'Université Laval.

8. Lynn, M. R. (1986). Determination and quantification of content validity. Nursing Research, 35(6), 382–385.

9. MESU (Ministry of Higher and University Education, DRC). (2018). Ministerial decree adopting the BSc-MSc-PhD system.

10. Mubalama, L., & Nzita, A. (2019). University partnerships and medical training in the DRC. Congo-Afrique, 59(534), 45–62.

11. Mukendi, K. (2018). Resistance to the LMD reform in Congolese universities. Revue Congolaise d'Éducation, 7(1), 88–104.

12. Nadler, J. T., Weston, R., & Voyles, E. C. (2015). Stuck in the middle: The use and interpretation of mid-points in surveys. The Journal of General Psychology, 142(2), 71–89.

13. Ndabaga, E. (2020). The APC in universities in eastern DRC. Journal of Higher Education in Africa, 18(2), 101–119.

14. Peduzzi, P., Concato, J., Kemper, E., et al. (1996). A simulation study of the number of events per variable in logistic regression. Journal of Clinical Epidemiology, 49(12), 1373–1379.

15. Perrenoud, P. (2018). Developing reflective practice. ESF Sciences humaines.

16. Roegiers, X. (2016). The pedagogy of integration (3rd ed.). De Boeck Supérieur.