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Evaluation of the teaching–learning process of the introduction to anaesthesia and resuscitation course in health institutes in the city of boma, Democratic Republic of the Congo

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ABSTRACT

Introduction: The teaching of anaesthesia and resuscitation is a key aspect of the training of professionals who will be called upon to manage life-threatening situations. This training must combine theoretical knowledge, technical skills, clinical reasoning, simulation and authentic assessment.

Objective: To evaluate the teaching and learning process of the 'Introduction to Anaesthesia and Resuscitation' course at health institutes in the city of Boma, by examining teaching methods, the availability of equipment, the organisation of practical sessions, assessment methods and the acquisition of skills.

Methods: A mixed-methods, descriptive, analytical and cross-sectional study was conducted involving 180 students. Quantitative data were collected via a structured questionnaire and analysed using Pearson's chi-square test at a 5 per cent significance level. Qualitative data were derived from semi-structured interviews with trainers, direct observations and a documentary analysis of syllabuses and examination papers.

Results: The ex-cathedra lecture method was predominant (68.9 per cent). The absence or inadequacy of simulation equipment affected 85.6 per cent of students, whilst 52.2 per cent had not undertaken any practical work. Assessments were exclusively written and theoretical for 73.3 per cent of students. Despite an acceptable to good level of theoretical knowledge among 76.7 per cent of respondents, 63.3 per cent demonstrated insufficient mastery of practical skills. Associations were found between teaching methods and practical proficiency ($\chi^2 = 38.42$; $p = 0.0001$), practical work and procedural proficiency ($\chi^2 = 45.18$; $p < 0.001$), simulation equipment and overall skills ($\chi^2 = 32.15$; $p = 0.0002$), and between type of assessment and clinical reasoning ($\chi^2 = 18.64$; $p = 0.0003$) were statistically significant.

Conclusion: The process studied reveals a disconnect between the transfer of knowledge and the development of practical skills. Strengthening teachers' pedagogical training, providing access to simulation, and aligning assessments with professional competencies appear to be priority areas for improvement.

Keywords: anaesthesia and intensive care; teaching and learning; medical didactics; simulation; competency-based approach; practical skills; Boma.

1. Introduction

The training of healthcare professionals cannot be reduced to the accumulation of declarative knowledge. It must enable learners to apply knowledge, practical skills and decision-making abilities in complex professional situations. This requirement is particularly important in anaesthesia and intensive care, a field in which errors or delays in treatment can have immediate consequences for the patient's prognosis. The transformation of healthcare professional training towards models that are more focused on skills and the needs of healthcare systems is therefore a major international challenge (Frenk et al., 2010).

From a professional pedagogy perspective, the teaching-learning process results from the interaction between the teacher, the learner, the content, the resources and the situations in which skills are developed. Constructivist and socioconstructivist approaches emphasise the importance of learner activity and engagement with problem-based situations (Vygotsky, 1985). The competence-based approach and integrative pedagogy, for their part, place central importance on the mobilisation of resources in contextualised situations (Roegiers, 2010; Tardif, 2006).

The teaching of anaesthesia and resuscitation therefore presents specific challenges. Learners must understand pathophysiology, pharmacology and safety principles— but must also know how to prepare equipment, ensure a clear airway, perform bag-valve-mask ventilation, participate in resuscitation and make decisions appropriate to an emergency situation. This learning process requires a combination of theory, demonstration, repetition, simulation, debriefing and clinical practice. Simulation is particularly valuable when it enables high-risk situations to be replicated in a controlled environment prior to exposure to real patients (Auroy et al., 2018).

However, in paramedic training systems facing material and pedagogical constraints, the gap between curriculum requirements and actual practice can be significant. The source material for this study highlights, in particular, the predominance of lecture-based teaching, the lack of simulation equipment, the low frequency of practical sessions and the predominance of written assessments. These factors may compromise the alignment between learning objectives, learning activities and assessment methods.

In Boma, in the Kongo-Central province of the Democratic Republic of the Congo, health institutes train some of the professionals who will go on to work in emergency departments, operating theatres and other units requiring

critical care skills. Despite this importance, the teaching and learning process for the ‘Introduction to Anaesthesia and Resuscitation’ course has been the subject of little documented research in the literature. This study therefore aims to evaluate this process by simultaneously considering teaching methods, teaching resources, practical sessions, assessment methods, and learners’ theoretical and practical learning outcomes.

2. Methods

2.1. Study design and methodology

This was a quantitative and qualitative, descriptive, analytical and cross-sectional study. The quantitative component aimed to measure the characteristics of the teaching-learning process and to investigate associations between certain pedagogical variables and levels of competence acquisition. The qualitative component complemented these findings by exploring the practices and constraints reported by trainers and observed in teaching situations.

2.2. Study setting and population

The study was conducted in health institutes in the city of Boma, in Kongo-Central, in the Democratic Republic of the Congo. The quantitative population consisted of students who had taken the ‘Introduction to Anaesthesia and Resuscitation’ course. The sample comprised 180 students from accredited public and private institutions. The qualitative component involved trainers involved in teaching the course or supervising practical sessions.

2.3. Data collection techniques and instruments

Four sources of data were utilised: a self-administered questionnaire for students, semi-structured interviews with trainers, a direct observation grid for sessions, and a document analysis grid. The questionnaire focused in particular on the respondents’ profiles, teaching methods, equipment, practical work, assessment procedures and the acquisition of skills. The interviews explored teachers’ pedagogical training, the adaptation of teaching methods, the organisation of practical work and institutional constraints.

2.4. Data analysis

The quantitative data were coded and then analysed in terms of frequencies and percentages. Relationships between categorical variables were examined using Pearson’s chi-square test, with a significance level set at 0.05. The qualitative data derived from the interviews, observations and documents were subjected to thematic analysis. Triangulation

of the various sources made it possible to reconcile students’ statements, trainers’ comments, field observations and teaching materials.

2.5. Ethical considerations

The study was conducted after obtaining the necessary authorisations from the heads of the institutions concerned. Participants were informed of the study’s objectives and the confidential nature of the information collected. Participation was voluntary and the data were processed anonymously.

3. Results

3.1. Participant characteristics

Variable	Category	N	%
Age	< 20 years	24	13.3
	20–24 years	118	65.6
	25 years and over	38	21.1
Gender	Female	102	56.7
	Male	78	43.3
Institution	Public	108	60.0
	Accredited private	72	40.0
Programme	Nursing	126	70.0
	Medical Technology	54	30.0

The majority of respondents were aged between 20 and 24 (65.6 per cent), female (56.7 per cent), enrolled at a public institution (60.0 per cent) and studying nursing (70.0 per cent).

3.2. Teaching methods, resources and practical work

Indicator	Main method	N	%
Teaching method	Lecture	124	68.9
	Demonstrative / interactive	36	20.0
	Active / case-based	20	11.1
Practical work	No practical work	94	52.2
	Theoretical practicals / verbal demonstration	58	32.2
	Practical work on a mannequin / simulator	28	15.6
Assessment	Written theory only	132	73.3
	Mixed written and oral	32	17.8
	Practical test using a grid / role-play	16	8.9

The ex-cathedra method was the predominant teaching method. More than half of the students reported having undertaken no practical work, and fewer than one in six had used a manikin or simulator. Authentic practical assessments accounted for only 8.9 per cent of the reported teaching methods.

3.3. Skills acquisition

Level	Theoretical skills n (%)	Practical skills n (%)
Inadequate	42 (23.3)	114 (63.3)
Average / partial	106 (58.9)	48 (26.7)
Good / operational	32 (17.8)	18 (10.0)

Total	180 (100.0)	180 (100.0)
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The learning outcomes profile reveals a contrast between the theoretical and practical dimensions. The theoretical level was acceptable or good among 76.7 per cent of students, whilst 63.3 per cent reported insufficient practical proficiency and only 10.0 per cent demonstrated good operational mastery of emergency procedures.

3.4. Bivariate associations

Relationship studied	χ^2	ddl	p	Statistical interpretation
Teaching method $\times$ practical proficiency	38.42	2	0.0001	Significant
Practical training $\times$ mastery of emergency procedures	45.18	2	< 0.001	Significant
Equipment $\times$ overall skills	32.15	2	0.0002	Significant
Type of assessment $\times$ clinical reasoning	18.64	2	0.0003	Significant
Teaching training $\times$ interactive methods	15.32	1	0.0001	Significant
Institutional status $\times$ completion of practical work	6.85	1	0.0088	Significant
Theoretical level $\times$ practical level	8.41	1	0.0037	Significant

The associations observed are statistically significant at the 5 per cent level. In particular, 87.2 per cent of students who had not undertaken any practical sessions demonstrated insufficient practical proficiency, compared with 14.3 per cent of those who had undertaken practical sessions on manikins. Furthermore, 83.7 per cent of students faced with non-existent or unavailable equipment had insufficient overall skills, compared with 23.1 per cent when equipment was available and adequate. Finally, 87.5 per cent of students assessed through role-play demonstrated high or good clinical

reasoning, compared with 30.3 per cent of those assessed via traditional written examination.

3.5. Qualitative findings

Interviews with trainers highlighted three main themes: initial teaching training deemed inadequate by several tutors, recurring material constraints, and large class sizes limiting individual practical training. One trainer stated: 'We are forced to teach intubation or resuscitation on the blackboard, as the institute does not have a functional intubation manikin. Students only see the equipment once they arrive for their placement in the operating theatre.'

Direct observations revealed a predominance of lectures, limited interactivity and, during the rare practical sessions, a group demonstration that did not allow every student to handle the equipment. The literature review also showed that the syllabuses complied with the curricula, whilst the summative assessments mainly comprised questions testing theoretical recall.

4. Discussion

This study highlights a teaching-learning process characterised by a strong predominance of the transmissive model and a limited availability of opportunities for practical learning. The use of the ex-cathedra method by 68.9 per cent of students can be understood in the light of the pedagogical and material constraints reported by the trainers. The significant association between teachers' pedagogical training and the use of interactive methods ($\chi^2 = 15.32$; $p = 0.0001$) suggests that the trainer's clinical competence alone is not sufficient to guarantee appropriate instructional design. The results are consistent with the competency-based approach, which requires learning and assessment situations to be designed in accordance with the expected competencies (Roegiers, 2010; Tardif, 2006).

The lack of simulation represents a second key finding. In the sample, 85.6 per cent of students reported a complete absence or a severe shortage of equipment, and 52.2 per cent had not undertaken any practical sessions. The link between undertaking practical sessions and mastery of emergency procedures was particularly marked: 87.2 per cent of students who had not undertaken practical sessions demonstrated insufficient mastery, whilst 85.7 per cent of those who had practised on manikins achieved partial or good mastery. These findings are consistent with the principles of experiential learning: complex procedures cannot be mastered simply by listening to a lecture. Simulation provides a space for practice,

repetition and feedback prior to exposure to real clinical situations.

The assessment methodology also reveals a lack of alignment. Exclusively written assessments were used for 73.3 per cent of students, compared with only 8.9 per cent for practical assessments using a checklist or in a simulated scenario. However, the association between assessment method and clinical reasoning was significant ($\chi^2 = 18.64$; $p = 0.0003$), with 87.5 per cent of students assessed in practical scenarios demonstrating high or good levels of clinical reasoning, compared with 30.3 per cent of those subjected to traditional written assessments. This finding is consistent with the principle of pedagogical alignment, according to which learning activities and assessments must be consistent with the targeted competences (Biggs, 2003).

The contrast between theoretical and practical attainment warrants particular attention. Whilst 76.7 per cent of students demonstrated an average to good level of theoretical knowledge, 63.3 per cent had insufficient practical mastery. Even amongst students with a good or high level of theoretical knowledge, 37.5 per cent remained inadequate in practical terms. This disconnect serves as a reminder that professional competence is not merely a matter of possessing information: it requires the integrated mobilisation of resources in a practical context. In the case of anaesthesia and intensive care, this integration must be particularly explicit due to the urgent and technical nature of the procedures.

Institutional status was also associated with the completion of practical sessions ($\chi^2 = 6.85$; $p = 0.0088$). Students from public institutions reported a higher number of practical sessions than those from accredited private institutions. This result should be interpreted as an observed difference within the sample rather than as a causal explanation of institutional functioning. It nevertheless highlights the importance of a common minimum standard of resources and teaching standards for all institutions providing training in anaesthesia and intensive care.

The qualitative data reinforce the quantitative findings. The account of intubation being taught 'on the blackboard' provides a concrete illustration of the difficulty in transforming a psychomotor objective into a learning activity when the necessary resources are lacking. The observation of sessions consisting mainly of lectures and the predominance of recall questions in examinations also confirm the gap between the prescribed competencies and the teaching practices actually observed.

These results must, however, be interpreted whilst taking into account the study's limitations. The cross-sectional design does not allow for the establishment of a causal relationship between pedagogical factors and levels of competence. Part of the assessment of practical skills is based on self-reported data, which may be subject to social desirability bias. Direct observations may also be affected by an observer effect. Finally, the results are limited to the health training institutes studied in Boma and cannot be automatically generalised to all training institutions in the DRC.

5. Conclusion

This study highlights significant shortcomings in the teaching and learning process for the 'Introduction to Anaesthesia and Resuscitation' course at health institutes in Boma. Training remains predominantly focused on lectures, whilst opportunities for simulation and practical exercises are limited. Assessments remain primarily theoretical, whilst the expected skills are largely practical and decision-making-based. The contrast between an acceptable to good level of theoretical knowledge among the majority of students and insufficient practical mastery among 63.3 per cent of them shows that the acquisition of knowledge alone does not guarantee professional competence.

The statistical correlations observed between teaching methods, practical work, availability of equipment, assessment methods and levels of competence reinforce the need for better alignment between objectives, learning activities and assessment. In this context, the development of simulation, continuing professional development for teachers, the organisation of practical work in small groups and the introduction of standardised practical assessments are approaches consistent with the study's findings.

6. Implications and recommendations

For institute managers: provide a minimum level of simulation equipment suitable for teaching intubation, ventilation and resuscitation; set aside budgets for the maintenance and replacement of consumables; organise students into sub-groups during practical workshops.

For teaching staff: strengthen skills in medical pedagogy, competency-based learning and assessment theory; develop case studies, problem-solving, guided demonstrations, individual practice and debriefing; align assessments with the competencies actually expected.

For clinical placement organisations: formalise school-hospital partnerships; clarify the practical objectives of

placements; and identify tutors capable of monitoring and documenting students' progress.

For future research: conduct longitudinal studies and use standardised practical tests administered individually, such as ECOS-style stations, to directly measure technical and decision-making performance.

Declaration of conflicts of interest

I declare that I have no conflict of interest in relation to this study.

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References

- Akodjénou, J., Chobli, M., & Zoumenou, E. (2021). Teaching anaesthesia and intensive care in French-speaking sub-Saharan Africa: Educational challenges and prospects for simulation. *African Journal of Anaesthesia and Emergency Medicine*, 26(1), 34–42.
- Auroy, Y., Benhamou, D., & Péquignot, F. (2018). Safety of care and simulation in anaesthesia and intensive care: From didactic focus to clinical practice. *Annales Françaises d'Anesthésie et de Réanimation*, 37(4), 215–224.
- Biggs, J. (2003). Teaching for quality learning at university: What the student does (2nd ed.). Society for Research into Higher Education & Open University Press.
- Frenk, J., Chen, L., Bhutta, Z. A., Cohen, J., Crisp, N., Evans, T., Fineberg, H., Garcia, P., Ke, Y., Kelley, P., Kistnasamy, B., Meleis, A., Naylor, D., Pablos-Mendez, A., Reddy, S., Scrimshaw, S., Sepulveda, J., Serwadda, D., & Zurayk, H. (2010). Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. *The Lancet*, 376(9756), 1923–1958.
- Ilunga, M., & Banza, K. (2022). Assessment of practical nursing skills in Haut-Katanga: Educational alignment and assessment challenges. *Journal of Medical and Paramedical Sciences of the Congo*, 14(2), 88–97.

- Kasongo, P., Mukendi, F., & Tshilombo, C. (2021). Didactic transposition in the teaching of medical techniques in the DRC: Analysis of teaching behaviours in relation to the APC. *Congolese Journal of Pedagogy and Didactics*, 8(3), 112–128.
- Ministry of Public Health [DRC]. (2020). Guiding standards for the training of paramedical professionals and healthcare technicians. Directorate of Medical Education.
- Ministry of Higher and University Education [MINESU-DRC]. (2021). Regulatory framework and model curricula for the LMD/APC system in Health Sciences. Official Journal of the Democratic Republic of the Congo.
- Mukendi, T., & Ntumba, A. (2019). Shortcomings in teaching infrastructure and the quality of paramedical training in the Democratic Republic of the Congo. *African Health Research Journal*, 11(1), 45–59.
- World Health Organisation [WHO]. (2020). Global Standards for the Initial Training of Health Professionals and Patient Safety. WHO Publications.
- Roegiers, X. (2010). The pedagogy of integration: Education and training systems at the heart of our societies. De Boeck Supérieur.
- Tardif, J. (2006). Competence assessment: Documenting the development pathway. Éditions Chenelière Éducation.
- Vygotsky, L. S. (1985). *Thought and Language*. Éditions Sociales.