

‘Sense of belonging’: The influence of individual factors in the learning environment of South African interns

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Background. The focus is usually on organisational issues when reporting factors influencing the perceptions of South African (SA) medical interns regarding their learning environment (LE). Individual demographic factors are now being recognised as equally important in influencing these perceptions.

Objective. To determine whether individual demographic factors influence interns’ perceptions of the LE during their paediatrics rotation in hospitals burdened with high disease in SA.

Methods. Perceptions of the LE among interns in KwaZulu-Natal, SA, were assessed in December 2015, using a validated version of the Postgraduate Hospital Educational Environmental Measure (PHEEM). Overall and subscale PHEEM scores were calculated using Likert scales. The association of these scores with various sociocultural factors relevant to the SA context, previous educational exposure and year of internship were examined using ANOVA or Student *t*-tests.

Results. A total of 209 interns (59.3%) was sampled. The ethnic breakdown of sampled interns reflected the changing demographic profile of SA junior doctors. Statistically significant associations of overall and teaching subscale PHEEM scores were found with ethnicity ($p=0.024$), urban/rural status ($p=0.023$), year of internship ($p=0.0047$) and university origin ($p=0.015$). These factors corroborated characteristics that reflect both past disadvantage in the SA context, and those of being an ‘outsider’ in an established group.

Conclusions. Intern training programmes in SA need to recognise that individual demographic factors influence interns’ perceptions in the context of teaching and mentoring in a discipline. With rapid changes in the demographic profiles of junior doctors, SA intern trainers need to enable a ‘sense of belonging’ in LEs.

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The learning environment (LE) refers to a ‘set of factors’ that describes the experiences of the trainee within an organisation.^[1] These factors can be divided into three components. The first is the ‘physical environment’ (facilities, comfort, safety and food), which are the organisational aspects. Work load and work hours would also relate to this aspect.^[2] The second component is the ‘intellectual environment’, which includes support provided for scholarly activities during training, learning with patients and using evidence-based knowledge and skills.^[2] The third component is the ‘emotional environment’, referring to the social support provided, the levels of harassment experienced by the trainee and the trainee’s characteristics that may facilitate or hinder access to support, including that offered by a supervisor.^[2] The effect of the LE appears to be mediated by the trainees’ own perceptions thereof, and this has been shown to be an important determinant of attitude, satisfaction and achievements.^[3,4] An optimally functioning clinical LE, where medical interns perceive it as such, is important for successful training in any platform to develop competent physicians.^[5]

Emphasis has previously been placed on evaluating the organisational aspects of these training platforms.^[6,7] The environment in which South African (SA) medical interns train has been associated with excessive workloads, long hours, high stress levels, burnout and reports of suboptimal

supervision.^[8-10] While these organisational aspects form a significant segment of the factors affecting perceptions of the LE, the influence of individual demographic factors also needs to be explored and understood.^[11]

The legacy of apartheid policies and persistent social inequity in SA has continued to manifest in society, including in education.^[12] The characteristics linked to social inequity, such as gender, ethnicity and socioeconomic status, have persisted, and remain useful as criteria to measure previous disadvantage. Urban/rural status still reflects racial and socioeconomic divisions, and plays an important role in access to and success in higher education.^[12] Previous educational experiences are considered important contextual factors in learning and in the SA context; huge disparities exist between the education offered by fee-paying compared with non-fee-paying schools.^[13]

In the higher-education climate, including health professions education in SA, calls are being made to challenge and dismantle the colonial curricula mindsets that perpetuate the ideological framework that allows one culture to dominate others.^[14] While these calls for ‘decolonisation’ include aspirations for the ‘creation of a humanising culture of practice that is not at odds with lived practice’, education processes are still noted to have a ‘mandated ignorance’, with LEs seemingly blind to issues of race and difference.^[15]

Demographic factors are being recognised as important indicators of inequity that can be used for its redress, and most SA medical schools have amended their undergraduate selection criteria towards transformation norms.^[13] This has seen a rapid change in the demographic composition of the intern population in SA. As a result of these changes, interns of differing socioeconomic and educational backgrounds are allocated to work and learn together in regional hospitals throughout the country for a 2-year internship.

The internship programme includes all major medical specialties, including paediatrics.^[16] It is not clear how the changes in the composition of the group of newly qualified doctors have influenced their perceptions of the LE, especially in paediatrics. An improved understanding of these changes would facilitate the improvement of training for junior doctors. The Postgraduate Hospital Educational Environmental Measure (PHEEM) is a well-recognised instrument used internationally to assess the LE in postgraduate medicine.^[17-19] A local SA version of the PHEEM instrument was validated among a cohort of paediatric interns in four hospital complexes in Durban and Pietermaritzburg, KwaZulu-Natal (KZN).^[18]

While organisational and institutional factors were identified as obstacles to creating an ideal LE, significant differences were noted in the way interns and their supervisors perceived the LE, especially with regard to supervision and mentoring.^[18] In this study, we report on the influence of individual demographic factors on perceptions of the LE among this cohort. This study was thus conducted to:

- (i) determine whether individual demographic factors influence interns' perceptions of their experiences in the LE in paediatrics;
- (ii) compare the perceptions of first- and second-year interns of the LE in the paediatric rotation; and
- (iii) determine the influence of previous educational experiences on paediatric interns' perceptions of their LE.

Methods

Research design and ethics approval

This was an observational, cross-sectional cohort study. Ethical approval for the study was obtained from the University of KZN Biomedical Research Ethics Committee (ref. no. BE 177/15), and gatekeepers' permission was granted from the various institutions, as well as the Health Research and Knowledge Management subcomponent of the Department of Health in the province of KZN. The study population consisted of all eligible interns, who were informed of the study and invited to participate. Participants were informed of their rights, and could withdraw at any stage. Participation in the study was voluntary, and the anonymity and confidentiality of respondents were assured. The surveys were group-administered at pre-existing intern meetings, and the primary researcher was blinded to the individual responses as no identifying details were required.

The instrument

The PHEEM has been used to assess the LE among interns throughout the world.^[17] The PHEEM used in our study had eight minor changes made to the original 40 items to accommodate terminology relevant to the SA and paediatric setting.^[18] Each item was scored by participants on a five-point Likert scale, where 1 indicated 'strongly disagree' and 5 represented a 'strongly agree' response. The original questionnaire used a 0 - 4 scale, while we followed a more conventional scale of 1 - 5, as used by some authors in clinical settings.^[3]

Procedure

The sample population included all interns who had completed a paediatrics rotation at four hospital complexes (comprising eight hospitals) in both major cities of the KZN province in December 2015. Demographic data, including gender, ethnicity, home language, urban/rural status and the highest educational level of a 'parental figure' were obtained. Three categories of urban/rural status were recognised, namely urban (mainly city and suburban neighbourhoods), semi-urban (reflecting mainly 'township' neighbourhoods) and rural (mainly outside of an urban or semi-urban area). These distinctly different area types reflect significant racial and socioeconomic divisions in the SA context.^[12] Data on prior educational exposure were also solicited, on the type of high school attended (whether fee-paying or non-fee-paying) and university origin (whether the intern graduated from the local university (University of KwaZulu-Natal) or from another university in a different province or country), and on interns' final-year undergraduate paediatric performance.

Sample size

A sample-size calculation was based on the comparison of the PHEEM scores between the intern group and various demographic variables. Using a one-way ANOVA with up to four groups, the sample size of 209 interns was found to be adequate, as a sample of 180 was required to achieve 80% power at a 5% significance level.^[20]

Data analysis

The overall PHEEM scale and subscale scores were calculated for each participant. Where there were missing data, means were computed based on data for available items, provided this did not exceed 20% of the items. The overall score was computed as the average of all 40 items. The negatively worded items 7, 8, 11 and 13 were reverse-scored.

For the descriptive analysis, categorical variables were summarised by frequency and percentage tabulation. Continuous variables were summarised by mean, standard deviation, median and interquartile range. The association between the various demographic variables, year of internship and the factors associated with previous educational experiences, with overall PHEEM score as well as the three subscale PHEEM scores, was determined by the *t*-test or ANOVA (for more than two categories). The strength of the association was measured by Cohen's *d*. The following scale of interpretation was used: ≥ 0.8 = large effect; $0.5 - 0.79$ = moderate effect; and $0.2 - 0.49$ = small effect. Data analysis was carried out using SAS Version 9.4 for Windows (SAS, USA). The 5% significance level was used throughout.

Results

A response rate of 59.3% was achieved, as 209 completed questionnaires were returned from a potential pool of 352 interns. Of these, 35.8% of the interns assessed were in their first year and 63.8% in their second year of internship, and 55% were female. The mean age of the whole group was 26.2 years (standard deviation (SD) 2.6; range 20 - 37 years). A number of factors were examined to investigate the influence of previous disadvantage on perceptions. Table 1 presents the sociocultural characteristics of the sampled interns. Table 2 shows the composition of sampled interns with regard to variables indicating previous educational experiences.

An examination of the influence of various demographic factors on the overall PHEEM scores indicated a number of significant findings. Table 3 depicts the

Table 1. Sociocultural characteristics of sampled interns (N=209)

Variable	n (%)
Gender	
Male	91 (45.05)
Female	111 (54.95)
Ethnicity	
White	53 (27.89)
Indian	64 (33.68)
Black African	60 (31.58)
Coloured	13 (6.84)
Home province	
KZN	112 (66.67)
Gauteng	27 (16.07)
Western Cape	23 (13.69)
Eastern Cape	6 (3.57)
Urban/rural status	
Urban	119 (58.91)
Semi-urban (township)	63 (31.19)
Rural	20 (9.90)
Home language*	
English	105 (62.87)
Afrikaans	29 (17.37)
Zulu	25 (14.97)
Xhosa	8 (4.79)
Highest achieved educational level of parent/caregiver	
Less than high school completion	15 (7.54)
Completed high school	17 (8.54)
Non-university tertiary	33 (16.58)
University	134 (67.34)

KZN = KwaZulu-Natal.

*Other home languages were insignificantly represented, so excluded from the table/analysis.

Table 2. Previous educational experience of sampled interns (N=209)

Variable	n (%)
High school type	
Non-fee-paying government	87 (43.50)
Fee-paying government	63 (31.50)
Fee-paying private	50 (25.00)
University origin: local (UKZN) v. non-local (all other)	
Local	60 (29.56)
Non-local	143 (70.44)
University origin: SA v. non-SA	
SA	162 (81.00)
Non-SA	38 (19.00)
Undergraduate paediatrics performance	
<60% pass	19 (9.45)
60% - 70% pass	112 (55.72)
>70% pass	70 (34.83)

UKZN = University of KwaZulu-Natal.

Table 3. Comparisons of the overall mean PHEEM scores with all demographic variables

Sociocultural factors	n, mean (SD)	p-value*
Gender		
Male	90, 3.48 (0.48)	0.59
Female	109, 3.52 (0.52)	
Ethnicity		
White	53, 3.57 (0.36)	0.024
Indian	64, 3.55 (0.55)	
Black African	57, 3.37 (0.55)	
Coloured	13, 3.78 (0.27)	
Home province		
KZN	11, 3.52 (0.54)	0.68
Gauteng	26, 3.64 (0.26)	
Western Cape	23, 3.50 (0.38)	
Eastern Cape	6, 3.46 (0.34)	
Urban/rural status		
Urban	117, 3.59 (0.45)	0.023
Semi-urban (township)	62, 3.37 (0.60)	
Rural	20, 3.50 (0.44)	
Home language†		
English	105, 3.55 (0.48)	0.16
Afrikaans	29, 3.64 (0.35)	
Zulu	24, 3.40 (0.59)	
Xhosa	8, 3.29 (0.48)	
Highest level of education of parent/caregiver		
Less than high school completion	15, 3.43 (0.81)	0.66
Completed high school	17, 3.40 (0.50)	
Non-university tertiary	32, 3.51 (0.50)	
University	133, 3.54 (0.48)	
Internship year		
First year	72, 3.37 (0.56)	0.0047
Second year	126, 3.58 (0.47)	
High school attended		
Non-fee-paying government	85, 3.49 (0.55)	0.61
Fee-paying government	62, 3.49 (0.51)	
Fee-paying private	50, 3.57 (0.48)	
University origin: local (UKZN) v. non-local		
Local (UKZN)	59, 3.64 (0.56)	0.094
Non-local	141, 3.45 (0.49)	
University origin: SA v. non-SA		
SA	160, 3.54 (0.50)	0.094
Non-SA	37, 3.38 (0.53)	
Undergraduate paediatric pass mark		
>70%	69, 3.51 (0.45)	0.99
60% - 70%	110, 3.50 (0.55)	
<60%	19, 3.50 (0.54)	

PHEEM = Postgraduate Hospital Educational Environmental Measure; UKZN = University of KwaZulu-Natal.

*Statistical significance was indicated at $p < 0.05$.

†Other home languages were insignificantly represented, so excluded from the table/analysis.

relationship between all the individual demographic variables, including sociocultural factors, factors indicating previous educational experience and internship year, and the overall PHEEM score.

Sociocultural variables

There was a significant association between ethnicity and the overall PHEEM score. Interns who had self-identified as black African had lower

mean PHEEM scores than their white, Indian or coloured colleagues. This finding was reiterated when comparing ethnicity with PHEEM scores on the teaching subscale ($p=0.0026$) (Table 4). The effect size was large when comparing the scores of coloured ($d=0.88$) and Indian ($d=0.5$) with black African interns.

There was a significant association between the mean PHEEM score and urban/rural status, with those who indicated that they came from a semi-urban (mainly referring to a 'township' area) environment having a lower overall PHEEM score than those from urban (city or suburbs) rural areas

Table 4. Comparison of PHEEM teaching subscale scores with all demographic variables

Sociocultural factors	<i>n</i>	mean	SD	<i>p</i> -value
Gender				
Male	90	3.56	0.55	0.91
Female	110	3.57	0.62	
Ethnicity				
White	53	3.62	0.38	0.0026
Indian	64	3.68	0.65	
Black African	58	3.36	0.66	
Coloured	13	3.89	0.30	
Home province				
KZN	110	3.60	0.64	0.81
Gauteng	27	3.67	0.29	
Western Cape	23	3.55	0.42	
Eastern Cape	6	3.47	0.51	
Urban/rural status				
Urban	117	3.65	0.53	0.032*
Semi-urban (township)	63	3.42	0.68	
Rural	20	3.52	0.52	
Home language				
English	105	3.65	0.57	0.032
Afrikaans	29	3.69	0.33	
Zulu	24	3.38	0.70	
Xhosa	8	3.22	0.61	
Highest level of education of parental figure				
Less than high school completion	15	3.35	0.94	0.32
Completed high school	17	3.42	0.53	
Non-university tertiary	33	3.58	0.58	
University	133	3.61	0.57	
Year paediatrics rotation done				
First year	72	3.41	0.64	0.0083 [†]
Second year	127	3.64	0.56	
High school attended				
Non-fee-paying government	86	3.54	0.66	0.30
Fee-paying government	62	3.51	0.57	
Fee-paying private	50	3.68	0.54	
University origin: Local (UKZN) v. non-local				
Local (UKZN)	59	3.74	0.67	0.0068
Non-local	142	3.49	0.56	
University origin: SA v. non-SA university qualified*				
SA	161	3.59	0.59	0.19 [‡]
Non-SA	37	3.45	0.60	
Undergraduate paediatric pass mark				
>70%	70	3.56	0.55	>0.99
60% - 70%	110	3.56	0.63	
<60%	19	3.56	0.67	

*On role autonomy subscale $p=0.013$.

[†]On role autonomy subscale $p=0.00089$.

[‡]On social subscale $p=0.047$.

(Table 3). There were statistically significant associations between urban/rural status and the mean PHEEM score on the teaching subscale ($p=0.032$) and the PHEEM score on the role-autonomy subscale ($p=0.013$) (Table 4).

Table 4 shows the mean PHEEM teaching subscale scores compared with the major languages spoken by interns, which also showed a significant association ($p=0.032$).

We found no statistically significant relationship with gender, home province or the highest educational level of an intern's parental figure, when comparing overall PHEEM scores and all subscale scores with these sociocultural variables. There were no significant associations when we compared the PHEEM subscale scores on the social-support scales with all sociocultural variables.

Internship year

The mean PHEEM score for interns in their first year was significantly lower than that of interns in their second year of internship. This significant difference between year 1 and 2 interns was seen when comparing PHEEM scores on the teaching subscale ($p=0.0083$) (Table 4), as well as on the PHEEM role-autonomy subscale scores ($p=0.0089$).

Prior educational exposure

Table 4 indicates that interns who had graduated from the local university had significantly higher perceptions of the LE than interns who had graduated outside the province. There was a significant association between the mean PHEEM scores of interns who studied overseas, and SA-trained interns, on the social support subscale score. Neither the type of high school attended nor undergraduate performance in paediatrics showed any statistically significant relationship with overall PHEEM score or with the PHEEM scores on the teaching, role-autonomy and social support subscales.

Discussion

In this study, individual demographic factors are shown to have a major impact in influencing interns' perceptions of the LE. These characteristics have been largely neglected as factors to consider in influencing internship, while organisational factors such as work-hours and the state of the physical infrastructure of the LE have been focused on.

The good response rate in our sample was in keeping with surveys using the PHEEM instrument elsewhere,^[17] and the distribution of sampled interns closely represented the allocation of interns across the hospital complexes. The 2015 cohort shows an increasing representation of female and black African newly qualified doctors compared with previous years, and is beginning to reflect the implementation of amended selection criteria at SA medical schools.^[13] However, evaluating the demographic characteristics of the sampled interns revealed that the newly qualified doctors are still largely drawn from middle-class backgrounds, with nearly 60% of interns originating from urban areas, 56.5% attending fee-paying schools and over 60% from homes with at least one parental figure having obtained a university qualification.

In this study, ethnicity, language and urban/rural status were identified as factors that are significantly associated with lower perceptions of the LE in internship. These relationships corroborate the notion that interns from previously disadvantaged communities have poorer perceptions of the LE than most of their peers in internship. Gender was not identified as a factor influencing perceptions of the LE. Paediatrics is generally a discipline with a larger female composition, and thus probably reflects a more gender-

sensitive environment. Various other studies have shown the influence of gender on the overall PHEEM scores, especially in disciplines with an underrepresentation of female doctors such as general surgery and intensive care.^[21,22]

This study showed a clear difference in the perceptions of interns who were in their first year as compared with those in the second year of internship. Various studies internationally corroborate this finding, with juniors having less positive perceptions of the LE than senior trainees.^[23] Interns who did not graduate from the university supporting the internship training platform, and those who graduated outside SA, also displayed poorer perceptions of the LE. These findings are consistent with the findings of studies that reported higher levels of stress among interns at hospitals in SA who graduated from non-local universities.^[9]

The findings show that while indices of socioeconomic disadvantage, especially ethnicity and urban/rural status, did influence interns' perceptions of the LE, these were not the only factors. The combination of factors that significantly influenced the perceptions of the LE relate to characteristics of being 'new' or 'different' to the established norms or 'culture'. The factors can furthermore be categorised as individual characteristics that seemingly add to perceptions of marginalisation or 'alienation' in interns who experienced their training as 'being isolated from a group activity in which they should be involved'.^[24] This difficulty in developing a 'sense of belonging' is of concern, especially as learning within the clinical environment relies heavily on participation within a 'community of practice' that is provided by the authentic work environment.

Learning in internship occurs within the context of 'legitimate, peripheral participation' within a social context, and is an increasingly communal and negotiated contract.^[25,26] This learning, while understood at an individual level, occurs at group level, and involves the acquisition of knowledge, skills, attributes, values and competencies and 'participation in social processes' where learning is inextricably linked to and embedded in its context.^[27]

The interaction between supervisors and interns occurs within a historic context, and reflects a 'colonised' culture where the relationship of dominance creates the concept of the 'outsider',^[28] and in new incumbents, a notion of being the 'other' or not being welcome in an already established setting that does not recognise his/her presence. These unequal power relations and marginalisation may contribute to a failure to ensure that all interns are brought into full participation.^[14] The learning climate, in this context, may thus be difficult for interns who experience it from the position of 'outsiders' or 'others', and they are unlikely to seek or initiate a search for effective mentorship, a situation that further compromises the supervision opportunity.

These findings, which are of relevance to all health professionals and to undergraduate universities, indicate the need for efforts to ensure that all interns develop a 'sense of belonging' in their training platform. The impact of the findings on policy includes the recognition by intern accreditation bodies of the role of individual intern characteristics as important factors to consider when developing intern training curricula and oversight frameworks. This can translate into processes to mandate the development of welcoming environments that facilitate the integration of interns from the start, so that they commence as a team respecting and appreciating each other's contexts and diversity. The calls to work as a collective to 'decolonise' and humanise training have resonance here.^[14] Intern programmes and curricula need to change to evaluate intern and supervisor interactions, to ensure that all interns experience optimal supervision and that individual demographic factors are taken into consideration.

As the SA medical community transforms to reflect the true demographics of the country, efforts should be made to ensure the inclusion of and support for 'engagement' of junior doctors within hierarchical and 'established' communities of practice. Individual demographic factors in the LE can no longer be regarded as minor factors in the learning process, and more work is needed to understand how they impact on successful orientation and learning, especially in the formative period of internship.

Limitations

The sample only included interns linked to hospitals in one province, and the possibility exists that the findings could reflect a regional bias. However, the large number of interns sampled, the good response rate and the choice of large hospitals with known high disease burdens is thought to be adequately representative of the SA internship programme, and adds confidence that the findings would probably represent those of others, including other health professionals, in the SA setting.

The PHEEM instrument was originally created for postgraduate registrars; however, we believe that the LE of interns' work resembles that of the postgraduate registrar trainees, and PHEEM is therefore highly relevant.

This study did not explore the training received or the previous clinical experience of supervisors, which would influence the mentorship relationship in this setting.

This study used quantitative methods to assess the LE and to fully understand the LE in depth; a qualitative evaluation of interns' perceptions of the LE is also needed.

Conclusion

While organisational factors have been noted to affect the LE of interns in SA, our research indicates that individual demographic factors are important. Perceptions of the LE, as measured by validated and reliable tools like the PHEEM, are influenced by various demographic and individual factors. First-year interns who have not graduated from the local university and who are from previously disadvantaged socioeconomic groups in SA are more likely to perceive a poorer LE than their peers. These factors affecting a 'sense of belonging' will become apparent in challenged situations where there is inadequate supervision and mentoring, and within the rapidly transforming demographic environment in SA as it attempts to 'decolonise' its practices.

Efforts must be made to ensure that medical-intern and all health-professional training policies and practices recognise that these factors must be considered during teaching, mentoring and supervision. Further qualitative studies into these relationships are needed to improve our understanding in clinical settings as we aim to train competent health professionals for effective practice in transformed settings.

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