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Reliability and Validity of the Botswana Educator Job Satisfaction Survey (BEJSS)

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Abstract

There are many existing teacher job satisfaction instruments, but we found none adequately accounted for the unique challenges educators face in Botswana. Culturally relevant surveys can be challenging to find in non-Western, developing contexts. Secondary education in Botswana has specific characteristics, such as a centralised curriculum, rural-urban resource disparities, difficulties accessing continued professional development and off-campus teacher housing. Our study aimed to design the Botswana Educator Job Satisfaction Survey (BEJSS) with relevant constructs for Botswana and similar contexts. Herzberg's Two-factor theory of motivation guided our instrument design for conceptualising job satisfaction. Following an exploratory sequential QUAL-QUAN design, we used mixed methods research (MMR) with an inductive approach. Five educational experts were involved in our study for the item generation and content validation phase. The sampled teachers came from senior secondary schools in Botswana's North-East region, and we randomly selected 25 teachers for five focus groups. The items were generated and refined based on the expert inputs and the focus group themes. During the quantitative phase, we randomly selected teachers to complete the BEJSS, and the total sample size was 51 respondents. For the qualitative data analysis, we used Reflexive Thematic Analysis (RTA), and for the item and instrument analysis, the Rasch Rating Scale Model was applied with Winsteps. The MMR results for the new instrument showed sufficient evidence of internal reliability and validity. Our study contributes a new instrument to teacher job satisfaction in Botswana, tailored for school settings with similar contexts.

Key Terms: Botswana Educator Job Satisfaction Survey (BEJSS); Culturally relevant surveys; Instrument design and validation; Mixed Methods Research (MMR); Rasch Rating Scale Model; Teacher Job Satisfaction

Introduction and Background

Teacher job satisfaction is related to improved performance, positive attitudes, enhanced motivation levels, reduced absenteeism rates, and less turnover and burnout (Aithal & Aithal, 2020). Job satisfaction is crucial for attracting and keeping the best-performing teachers within the educational system (Le et al., 2022). Teacher job dissatisfaction could lead to frequent work absenteeism and increased turnover, thus resulting in compromised organisational commitment and low productivity in the educational system (Sahito & Vaisanen, 2020; Yohannes & Wasonga, 2023). Educational systems require ways to monitor teacher job satisfaction to address problems related to employee dissatisfaction and wellness (Opoku et al., 2022). A learning institution's efficiency could be enhanced through a motivated, satisfied, and competent workforce whose contribution is realised and appreciated to promote workplace effectiveness (Tang, 2022). However, we found that many existing job satisfaction instruments were developed in Western contexts and did not account for the unique challenges faced by teachers in Botswana, such as sourcing staff and providing accommodation in rural areas (Epstein et al., 2015; Isaiah, 2013; Matsagopane & Tang, 2023). We piloted Lester's Teacher Job Satisfaction Questionnaire (TJSQ) in Botswanan schools, and we found insufficient evidence for reliability and validity in assessing teacher job satisfaction (Monyamane, 2024). Our current study, therefore, aimed to design a teacher job satisfaction survey for context-specific relevance since Botswana's education system has unique features (Mustafa & Ali, 2019; Tsai et al., 2024; Wolf et al., 2016). Some of the aspects of education in Botswana include:

- A focus on teaching to the test and memorisation (Makwinja, 2017)
- Large class sizes and overcrowding (Pheko et al., 2015)
- Poorly resourced schools and a lack of infrastructure (Ngwenya et al., 2018)
- Schools in rural areas provide off-campus housing to draw in teachers (Molosiwa & Boikhutso, 2016)
- There is a significant divide in the quality of education between urban and rural schooling (Magombeyi & Odhiambo, 2017)

Judge et al. (2020) and Puttewar et al. (2016) discuss the Hawthorne studies on job satisfaction as evidence that people do not only work to receive a salary and that many aspects of work motivate employees (Angel Alvarado et al., 2021). Researchers have therefore investigated the connection between job satisfaction factors and work performance beyond salary (Dassan Gwajekera & Matiku Joshua, 2024; Dhamija et al., 2019). Skaalvik and Skaalvik (2020) created a Teacher Job Satisfaction Scale, which contains intrinsic factors (job fulfilment, professional growth) and extrinsic factors (salary, working conditions). They found that intrinsic factors often had a stronger correlation with teachers' motivation and retention than merely salary (Skaalvik & Skaalvik, 2020). Similarly, Klassen et al. (2010) developed a multidimensional survey based on self-efficacy theory, showing that teachers' belief in their abilities strongly correlates with job satisfaction. Many newer instruments and research emphasise the importance of teacher well-being, mental health and the effects of burnout and relationships with workplace conditions (Dewey et al., 2023; Pheko et al., 2015; Skaalvik & Skaalvik, 2020).

According to Nwankwo and Ifeanyi (2021), factors widely used to determine employee satisfaction include salary, work, supervision, promotion, relations with colleagues, job security and working conditions. Researchers such as Toropova et al. (2021) and Iwu et al. (2018) found that an unconducive workplace, perceived low salaries and limited promotion opportunities significantly correlated with low teacher job satisfaction and unsatisfactory work performance. Unpleasant or unsafe working conditions can compel teachers to consider leaving the profession (Iwu et al., 2018). Salary significantly correlates with teacher job satisfaction (Hasanah & Supardi, 2020) despite Herzberg's Two-Factor theory describing it as a hygiene factor, not causing job satisfaction but maintaining a baseline satisfaction. We explain these contradictions by considering factors associated with job satisfaction to be more intertwined than previously reported, and we keep this in mind in our study. Studies by Hoque et al. (2023), Muguongo et al. (2015), and Sahito and Vaisanen (2020) identified promotion, recognition, working conditions, the work itself and supervision as vital aspects that contributed to improved teacher job satisfaction and efficiency as well as organisational commitment (Buted, 2023). Working conditions, supervision, and promotion positively influence improved teacher job satisfaction. Sims (2020) found that undesirable working conditions, perceived unsatisfactory supervision and limited promotion significantly affect teacher self-esteem, morale, and the overall productivity and quality of school education inputs. Crisci et al. (2019) reviewed instruments to measure teacher job satisfaction. These instruments include the Minnesota Satisfaction Questionnaire (MSQ), the Teacher Job Satisfaction Questionnaire (TJSQ) by Lester, the Job Satisfaction Survey (JSS) by Spector, the Job Description Index (JDI) and Job in General (JIG). The instruments

mentioned here were tailored to specific populations and contexts. We also investigated the available instruments but found them unsuitable for the context of Botswana's educational system and the unique needs of its teachers.

Theoretical point of departure

Our study was theoretically guided by Herzberg's Two-factor theory of motivation (Herzberg, 1966; Herzberg et al., 1959). The model defines job satisfaction as motivation (increased satisfaction) and hygiene factors (prevents dissatisfaction) (Sajid et al., 2018). Herzberg et al. (1959) described motivation as intrinsic to the job, such as positive relationships at work, and hygiene factors as extrinsic, such as salary and essential equipment. Our study applied Herzberg's Two-factor theory because it employs an inductive approach to discover new determinants and embraces a wide range of job satisfaction factors as determined by the focus group's findings (Thant & Chang, 2021).

Research questions

To design and refine our new instrument, we were guided by the following research questions:

1. Which aspects of job satisfaction are relevant to secondary school teachers in Botswana?
2. Which dimensions should be included in job satisfaction to produce valid and reliable inferences for the unique context?

Research Methodology

We adopted a Mixed Methods Research (MMR) approach because it allows researchers to broaden their inquiry through depth and breadth within the investigation (Corrigan & Onwuegbuzie, 2020; Onwuegbuzie & Poth, 2015). MMR is also recommended for scale development and our approach for our instrument design (Combrinck & du Preez, 2021; Zhou, 2019). We chose an exploratory sequential design (QUAL-QUAN approach), whereby qualitative data was gathered and thematically analysed first, followed by the instrument design and piloting (Boateng et al., 2018). We utilised focus group (FG) interviews with the teachers and qualitative feedback from our expert reviewers for item development and refinement. After piloting the instrument, we assessed the internal reliability and validity of the items, constructs, and instrument using Rasch's statistics (Rasch, 1960, 1993).

Sample

The qualitative sample comprised 25 randomly selected senior secondary school teachers from five schools in the North-East region of Botswana. Two-thirds of the focus group teachers were female, representing a broad range of subjects taught. Most of the participants had at least ten years of experience or more. Purposive sampling was used to select the five senior secondary schools as we wanted to focus on rural schools in Botswana, and teachers who fit the criteria (experienced, range of subjects taught) were invited to participate. The quantitative and qualitative samples had similar demographic profiles due to the purposive sampling. The quantitative data collection used the same schools, and 51 respondents completed the questionnaire. A panel of five education experts were recruited to help with item generation and refinement. Table 1 shows the background characteristics of the respondents who completed the newly designed BEJSS.

Table 1: Demographic information of BEJSS Respondents

Variable	Category	N	%
Gender	Male	17	33%
	Female	34	67%
Age	21 - 30 years	5	10%
	31 - 40 years	16	31%
	41 - 50 years	28	55%
	51 years+	2	4%
Experience	Less than 1 year	5	10%
	Between 1 and 5 years	4	8%
	Between 5 and 10 years	2	4%
	Between 10 and 20 years	28	55%
	Between 20 and 30 years	11	22%

Variable	Category	N	%
	More than 30 years	1	2%
Department	Mathematics and Science	9	18%
	Languages	14	27%
	Social Sciences	7	14%
	Practical Subject	10	20%
	Business & Accounting	2	4%
	Other	8	16%

Most of our sample was female (67%), and about half of the respondents were between 41 and 50 years old, followed by an approximate third of respondents between 31 and 40 years old. Our participants tended to be more experienced in teaching, with the majority having more than 10 years of experience. Our sample represented a range of subjects being taught in secondary schools.

Instruments

Our focus group guide contained seven questions designed to source the experiences and views of teachers about their job satisfaction in the Botswanan education environment. The quantitative data was collected through the newly developed BEJSS with a 4-point Likert scale of Strongly Disagree (1), Disagree (2), Agree (3), Strongly Agree (4) and Not Applicable (intentional missing data). The BEJSS comprises 28 closed-ended questionnaire items. Section A covers biographical and background information. In Section B, we designed five teacher job satisfaction constructs: Physical school environment, school management, teachers' accommodation and housing, teaching and learning resources, and remuneration. The constructs designed for the new questionnaire were based on the FG themes and the panel inputs.

Procedures

The FGs were conducted at the schools at the end of the day when teachers had free time. The FGs were recorded and transcribed. The panel experts sent qualitative comments, which were analysed and incorporated into the item design and refinement. The quantitative piloting of the questionnaire was done via an online survey sent to selected teachers using Qualtrics software (Qualtrics, 2023).

Data Analysis

The qualitative data were analysed using Reflexive Thematic Analysis (RTA) as recommended by Braun and Clarke (2006, 2022). The software package of NVivo Lumivero (2023) aided the researchers as a tool to identify patterns and relationships between and across the data. Once we were satisfied with the codes, we generated themes and checked for consistent patterns amongst the developed themes and sub-themes. We then refined, defined and renamed themes. Matching themes were combined, and those with inadequate supporting data were removed. Lastly, we compiled the findings of our study by addressing identified themes in a narrative format.

In terms of the quantitative data, we generated descriptive statistics using the IBM Statistical Package for the Social Sciences (SPSS), version 28 (IBM, 2024). For the item analysis, we used Winsteps, version 5.4.0.0 (Linacre, 2023a). The Rasch Rating Scale Model (RSM) (Andrich, 1978) was used to analyse the data obtained from the developed BEJSS and assess the construct validity (Combrinck & Inglis, 2020; Harmeni, 2022). During analysis, Rasch scales are transformed into the natural logarithm, called logits and the mean is set to 0 with a standard deviation of 1. A typical logit scale ranges from -5 to +5 (Fisher, 1992; Knoch & McNamara, 2015). To interpret the Rasch outputs, we used the following statistics and interpretations (Bond et al., 2021):

- Principal component analysis (PCA) indicates unidimensionality, and we expected that eigenvalues should be below 2 per construct (Linacre, 2023b).
- Reliability coefficients were obtained, and ranges above .700 were considered good (Field, 2024). Item and person separation indices of more than 2 were deemed acceptable indications of spread for people's abilities and item difficulty ranges (Boone, 2016).
- Item fit to the Rasch model was gauged using Outfit and Infit Mean Squares (MNSQ), and we used the guideline from Linacre (2023b) that values above 1.5 should be investigated, and values above 2 indicate items should be removed or rephrased (Combrinck, 2020).

- The Point-Measure correlation (PTMA) values were used to investigate item directionality and positive values were expected (Linacre, 2023b; Wright, 1992).
- Differential item functioning (DIF) was used as an indicator of item bias, and we considered large DIF values (greater than 0.50 logits) and statistically significant DIF ($p < .05$) as requiring scrutiny (Andrich, 2016; Boone, 2016; Boone et al., 2014).

We applied Spearman's rho in SPSS to examine the relationship among constructs. We chose Spearman due to the non-normality of the composite scores (Field, 2024). We used the following guidelines to interpret the coefficients as values between .10 - .29, indicating a small correlation, values between .30 – .49, indicating a moderate correlation and values above .50, indicating a large correlation (Cronbach, 1951; Alsaqr, 2021).

Ethical considerations

We followed all ethical regulations of the University of Pretoria and ethics was granted by the Ethics Committee of the Faculty of Education (EDU116/22). Teacher participants gave informed consent for the study. Before recording and transcription, teachers agreed for us to proceed with the processes. We stated that teachers could withdraw from our study anytime, and we focused on maintaining an ethically sound study.

Findings and Results

Here, we provide the results from our study's qualitative and quantitative phases and present our evidence for the scale reliability and validity of the Botswana Educator Job Satisfaction Survey (BEJSS).

Qualitative Focus Group Findings

Here, we report the six prominent themes that emerged during our study.

Theme 1: Working conditions and physical environment of the school problematic

Most participants were dissatisfied with the general working conditions and physical environment. Teachers indicated that there was delayed maintenance of the school infrastructure and that an acute shortage of teaching and learning resources contributed to low job satisfaction levels. For example, one of the teachers (T4) commented as follows:

"My school does not have enough furniture for teachers and students, including chairs, tables and lockers. The environment is not conducive to teaching and learning, demotivating teachers to perform their job effectively."

Theme 2: Teacher Housing and Accommodation provided is problematic

In many rural areas of Botswana, teachers must be recruited from outside the area and the school provides housing. However, our participants considered the quality and type of housing and accommodation provided to teachers who travel to live near the school problematic. The teacher participants said they are forced to share living spaces with other teachers, which they felt was their primary source of dissatisfaction. Teachers must share accommodation with other teachers and their families, creating crowded living spaces. Teachers saw this as inadequate and uncomfortable housing and said such situations negatively affect their wellbeing, job satisfaction and service delivery. Participant (T2) commented about teachers' housing as:

"The provision of accommodation to teachers is a big concern. I usually come to work in stressful conditions because I share with someone with a big family. Hence, I am not comfortable in my own space, which impacts my performance in the classroom and school in general."

Theme 3: Managerial transparency needed and the blame game

Teacher accountability is a contentious issue. Our participants said that if they are given more active roles in decision-making, their job satisfaction could improve. Some of our focus group participants described support from supervisors as insufficient, particularly when monitoring learners' behaviour and class performance. Participants (T5) said:

"I observed that my supervisors seldom visit my classes to provide me with support throughout the term. I however believe that, if supervisors could make it a point that they visit my classes regularly, to see how I teach and the challenges I encounter during my lessons, they could assist me to improve academic results."

Participants emphasised that supportive, well-defined and clear school supervision structures are crucial for job effectiveness and learner achievement. Teacher participants said they desire proper communication and information sharing between teachers and supervisors.

Theme 4: Job security leads to complacency, but financial constraints result in demotivation

There is a tension discovered during the focus groups, and that tension centres on being secure in your job but, at the same time, confidence leading to complacency. Conversely, if teachers do not have job security, they said this causes fear and dissatisfaction. Most of our teacher participants were permanently employed and said they were satisfied with their job security. A participant (T5) commented on the issue of teacher complacency on the job as thus:

"I realised that when teachers feel that they have secure jobs, they become complacent on the job and resort to being in a comfort zone, hence, not putting in extra effort to improve students' results."

On a contract basis, the participants felt dissatisfied with their jobs and feared contract non-renewal. Teachers with permanent and pensionable jobs said they felt safe and could relax. At the same time, this resulted in less effort to improve the school's results. According to the participants, they could perform at a relaxed pace while waiting to reach retirement age. The relaxed attitude was not true of all participants; a few who were permanently employed said the safety helped them to improve the quality of their work, as noted by T1:

> "The fact that my job is secure makes me satisfied. I feel free and work without fear, motivating me to put more effort and produce good results."

Based on this theme, we concluded that permanent employment is complex. Understandably, teachers desire job security, but whether this leads to higher job performance may vary greatly based on perceptions of what security means in the long term.

Theme 5: Transparent and competitive remuneration is crucial for teachers to feel valued and motivated

The participants felt that their employer does not use salary to improve teacher job satisfaction. Salary progression and increments are essential to enhance teacher job satisfaction, but our participants pointed out that often, there are no progression options. Teachers want periodical salary increments based on performance and teaching experience but said that instead, they have stagnant salaries, as highlighted by T14:

"Many teachers in secondary schools have reached the salary scale ceiling; some have been receiving the same salary for over 20 years now, without any increment. It's not motivating to have a stagnant salary regardless of an individual's work experience and performance."

According to participants, stagnant salaries cause financial stress among teachers, thereby reducing their job satisfaction and well-being. The findings emphasised the significance of providing teachers with competitive salaries which match their academic qualifications and work experience.

According to Teacher (T2):

“The government does not use salary increases to motivate teachers. Teachers are frustrated that the salaries of some of the students they used to teach are much more than theirs, despite their long service and outstanding performance. It is really frustrating to work without your efforts being recognized.”

Theme 6: Poor working conditions and inadequate promotion opportunities lead to reduced job satisfaction

Our participants said they were displeased with the unfavourable school conditions and limited promotion opportunities despite producing good learner results. Many of our focus group participants said that teachers had not been promoted since they were posted in the teaching fraternity due to few (36) senior secondary schools in the country. Teachers highlighted that unpleasant working conditions and lack of promotion increased their dissatisfaction levels and negatively impacted on their job performance. One of the participants (T18) commented saying:

“Teaching is a stressful vocation which needs passion and patience. The environment in many schools could be more conducive for teaching and learning. Therefore, I will not advise graduates to join teaching.”

Another teacher (T3) commented as follows:

"I got promoted eight years ago and have been receiving the salary of Senior Teacher 1 for those years. I no longer apply for promotions because I was rejected for three consecutive years when I applied for the Head of Department post."

We used these themes to develop our instrument so that items and constructs would align with teacher needs in Botswana.

Quantitative Piloting of Instrument

Table 2 shows the prominent themes which emerged from the focus group data analysis. We combined theme six (Poor working conditions and inadequate promotion opportunities lead to reduced job satisfaction) with theme 1 and theme 5 as there was a repetition of ideas, and the panel agreed with our decision.

Table 2: Focus Group Themes and Questionnaire Constructs alignment

Themes from Focus Groups	Questionnaire Constructs	Herzberg's Two-factor theory (Hygiene & Motivators)
Theme 1: Working conditions & physical environment of the school problematic	Physical Environment	Working Conditions & Work itself
Theme 2: Managerial transparency needed & the blame game	School Management	Supervision & Recognition
Theme 3: Teacher Housing and Accommodation provided is problematic	Teachers Housing	Personal Life & Housing security
Theme 4: Job Security, Transparent & competitive remuneration for feeling valued & motivated	Remuneration	Salary & Advancement
Theme 5: Poor working conditions & inadequate promotion opportunities	Teaching & Learning Resources	Status & Growth

The BEJSS items were based on focus group themes and relevant literature. As can be seen from Table 2, we incorporated Herzberg's Two-factor theory with the constructs we devised to relate to hygiene and motivators.

Item Descriptive statistics

Table 3 shows the percentages of participants who endorsed each category in the Likert scale.

Table 3: Item descriptive statistics – percentages who endorsed each category

Constructs	Statements	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
Physical Environment	1. My classroom has sufficient furniture to facilitate learning	18%	35%	29%	16%	2%
	2. My school's infrastructure is well-maintained	16%	37%	35%	12%	0%
	3. My school's infrastructure supports effective teaching & learning	8%	25%	51%	14%	2%
	4. The physical learning environment is comfortable for learners	6%	24%	57%	14%	0%
	5. The physical classroom motivates me to teach	8%	41%	31%	20%	0%
School Management	6. I am satisfied with the managerial supervision in my school	2%	18%	51%	27%	2%
	7. I have a good relationship with the managerial team at my school	2%	4%	53%	41%	0%
	8. My supervisor empowers me to be accountable for decisions	2%	10%	45%	43%	0%
	9. I am held responsible for learners' performance in national tests	2%	2%	35%	61%	0%
	10. My supervisor gives me responsibilities that make me feel valued	6%	10%	45%	39%	0%
	11. There are well-defined supervision structures in my school	4%	20%	39%	37%	0%
	12. My supervisor communicates their expectations of me clearly	6%	10%	57%	27%	0%
Teachers Housing	13. My school provides me with housing that meets my living standards	25%	25%	25%	18%	6%
	14. My budget is sufficient to pay for my self-arranged accommodation	33%	18%	35%	0%	14%
	15. The housing provided is spacious enough for me & my family	27%	22%	27%	8%	16%
	16. I enjoy the shared accommodation arranged by the school	46%	22%	2%	4%	26%
	17. The accommodation provided positively supports job performance	35%	12%	25%	12%	16%
Teaching & Learning resources	18. I have sufficient resources to provide engaging lessons	27%	45%	20%	8%	0%
	19. Current teaching & learning resources support quality education	16%	47%	25%	10%	2%
	20. I have adequate textbooks & other resources for hands-on learning	29%	49%	14%	8%	0%
	21. My school has sufficient space for practical activities	22%	37%	27%	12%	2%
	22. The teaching & learning resources are in good condition	31%	29%	25%	12%	2%
Remuneration	23. I am satisfied with the compensation I receive for my efforts	29%	47%	20%	4%	0%
	24. My salary matches my academic qualifications	31%	53%	12%	4%	0%
	25. The remuneration for teachers shows they are valued in society	39%	43%	14%	4%	0%
	26. I am satisfied with the transparency of salary decisions	35%	45%	18%	2%	0%
	27. If I improve my work performance, my salary is increased	49%	45%	4%	0%	2%
	28. My job provides adequate opportunities for financial growth	43%	41%	14%	2%	0%

Table 3 shows that there was a spread of options chosen. There were items with skewed choice selection, for example items 6 – 9 very few participants chose Strongly Disagree, and we discuss these later in our paper.

Rasch Rating Scale Analysis Results

Table 4 shows the reliability metrics and principal component analysis (PCA) eigenvalues per construct for the newly developed BEJSS.

Table 4: Rasch Rating Scale Results for reliability and principal component analysis BEJSS

Construct	Criteria	Statistic	Statistic
Physical Environment	Unidimensionality	PCA Eigen-value	1 .49
	Reliability & Separation	Item reliability α	0 .76
		Item separation Index	1 .77
		Person reliability α	0 .85
		Person separation index	2 .42
School Management	Unidimensionality	PCA Eigen-value	1 .83
	Reliability & Separation	Item reliability α	0 .84
		Item separation Index	2 .26
		Person reliability α	0 .82
		Person separation index	2 .10
Teachers Housing	Unidimensionality	PCA Eigen-value	1 .50
	Reliability & Separation	Item reliability α	0 .84
		Item separation Index	2 .29
		Person reliability α	0 .72
		Person separation index	1 .62
Teaching & Learning Resources	Unidimensionality	PCA Eigen-value	2 .03
	Reliability & Separation	Item reliability α	0 .70
		Item separation Index	1 .54
		Person reliability α	0 .89
		Person separation index	2 .78
Remuneration	Unidimensionality	PCA Eigen-value	2 .10
	Reliability & Separation	Item reliability α	0 .78
		Item separation Index	1 .89
		Person reliability α	0 .82
		Person separation index	2 .11

The PCA eigenvalues for most constructs were below the cut-off score of 2, indicating unidimensionality for the constructs (Linacre, 2002; Linacre, 2023a, 2023b), as seen in Table 4. The two Teaching and Learning Resources and Remuneration constructs had PCA values above 2, meaning they could form another construct and should be explored. When we dug into the results (contrast 1 from the PCA), we saw that items 21 and 22 could form their own construct for Teaching and Learning Resources. Considering Herzberg's Two-factor theory, all the items align with hygiene factors, and therefore, it did not make theoretical sense to split the items

into different constructs. Where the Remuneration construct is concerned, items 24, 26 and 27 could form a separate construct. We decided to keep this as one construct, considering how well all the items fit with the central idea of remuneration.

The item reliability scores (α) are consistent across constructs, ranging from 0.70 to 0.84, indicating good internal consistency (Bond et al., 2021). The value of coefficient alpha for the Rasch model should range between 0.71 and 0.99, and the current results indicate that the constructs are internally reliable (Fisher, 1992; Kusmaryono et al., 2022). The item separation indices show variability, with most constructs having values around or above 1.77, indicating a decent ability to discriminate between items based on their difficulty or effectiveness in distinguishing the construct.

Item Statistics

Table 5 shows the results of the BEJSS items from the Rasch model per construct and item.

Table 5: BEJSS item level results from Rasch model per construct and item

Constructs, Question No. & Short Description			Model			Mean Square (MNSQ)		Correlate	DIF
CONSTRUCT	NO	SHORT DESCRIPTION	MEAN MEASURE	VALID N	S.E.	INFIT	OUTFIT	PTMA	Prob. Male - Female
Physical Environment	1	My classroom has sufficient furniture to facilitate learning	0.63	50	0.29	0.99	0.96	0.86	0.337
	2	My school's infrastructure is well-maintained	0.70	51	0.28	1.38	1.45	0.75	0.611
	3	My school's infrastructure supports effective teaching & learning	-0.47	50	0.29	1.01	0.99	0.79	0.511
	4	The physical learning environment is comfortable for learners	-0.76	51	0.29	0.59	0.69	0.86	0.714
	5	The physical classroom motivates me to teach	-0.11	51	0.29	0.94	0.89	0.84	0.870
School Management	6	I am satisfied with the managerial supervision in my school	0.66	50	0.26	0.87	0.90	0.72	0.749
	7	I have a good relationship with the managerial team at my school	-0.38	51	0.28	0.74	0.66	0.74	0.014
	8	My supervisor empowers me to be accountable for decisions	-0.22	51	0.28	0.87	1.02	0.73	0.555
	9	I am held responsible for learners' performance in national tests	-1.38	51	0.32	1.79	2.12	0.44	0.958
	10	My supervisor gives me responsibilities that make me feel valued	0.22	51	0.26	0.85	0.84	0.79	0.584
	11	There are well-defined supervision structures in my school	0.49	51	0.26	0.65	0.69	0.84	0.655
	12	My supervisor communicates their expectations of me clearly	0.62	51	0.25	1.31	1.34	0.61	0.131
Teachers Housing	13	My school provides me with housing that meets my living standards	-0.65	48	0.23	0.85	0.86	0.82	0.770
	14	My budget is sufficient to pay for my self-arranged accommodation	-0.20	44	0.24	1.21	1.23	0.66	0.707
	15	The housing provided is spacious enough for me & my family	-0.21	43	0.25	0.63	0.61	0.85	0.765
	16	I enjoy the shared accommodation arranged by the school	1.23	37	0.30	1.31	1.60	0.61	0.981
	17	The accommodation provided positively supports job performance	-0.17	43	0.25	1.08	1.01	0.80	0.725
Teaching & Learning resources	18	I have sufficient resources to provide engaging lessons	0.41	51	0.29	0.73	0.71	0.88	0.633
	19	Current teaching & learning resources support quality education	-0.58	50	0.29	0.60	0.59	0.89	0.052

Constructs, Question No. & Short Description			Model			Mean Square (MNSQ)		Correlate	DIF
CONSTRUCT	NO	SHORT DESCRIBE	MEAN MEASURE	VALID N	S.E.	INFIT	OUTFIT	PTMA	Prob. Male - Female
	20	I have adequate textbooks & other resources for hands-on learning	0.75	51	0.29	0.94	0.96	0.84	0.565
	21	My school has sufficient space for practical activities	-0.58	50	0.29	1.24	1.25	0.81	0.635
	22	The teaching & learning resources are in good condition	0.00	50	0.29	1.45	1.42	0.81	0.122
Remuneration	23	I am satisfied with the compensation I receive for my efforts	-0.80	51	0.29	0.92	1.00	0.81	0.353
	24	My salary matches my academic qualifications	-0.37	51	0.30	0.82	0.73	0.82	0.474
	25	The remuneration for teachers shows they are valued in society	-0.10	51	0.30	1.06	1.07	0.79	0.895
	26	I am satisfied with the transparency of salary decisions	-0.28	51	0.30	1.26	1.42	0.73	0.639
	27	If I improve my work performance, my salary is increased	1.27	50	0.34	0.84	1.15	0.72	0.666
	28	My job provides adequate opportunities for financial growth	0.27	51	0.31	0.96	0.95	0.79	0.693

There were two items with OUTFIT MNSQ values above 1.50, numbers 9 and 16. The teacher participants Agreed or Strongly Agreed that they are held accountable for learners' assessment results (item 9), and almost no one disagreed with this item. We considered the contribution of the item and decided to keep it as we consider it an essential part of the construct. The item could be revised in future versions of the BEJSS. In item 16, teachers tended to Disagree or Strongly Disagree that they like the housing provided by the school. Again, the item was maintained as it revealed vital information about housing provided for teachers in Botswana.

The Point-Measure Correlation (PTMA) values were all positive, as required and above the minimum value of 0.30 (Andrich, 2016; Boone et al., 2014). To identify potential bias, we examined the Differential Item Functioning (DIF) for the background variable of gender. The only item which showed significant DIF between males and females was item 7. When this was further investigated, the contrast was 1.01 and statistically significant. Female teachers Agreed or Strongly Agreed with the statement much more than their male counterparts. After careful consideration, we concluded that the item is not inherently biased but rather reveals fundamental differences between the genders, and we decided to keep it as it is.

Correlation of the constructs

The constructs were correlated using Spearman's rho due to the non-normality of composite scores. We share the correlation matrix in Table 6.

Table 6: Correlation matrix of BEJSS constructs

		1	2	3	4	5	6
1. Physical Environment	Coefficient	--					
	Sig.						
	N	51					
2. Remuneration Structure & Fairness	Coefficient	0.457**	--				
	Sig.	0.001					
	N	51	51				
3. Remuneration Personal & Societal Value	Coefficient	0.468**	0.680**	--			
	Sig.	0.001	0.000				

	N	51	51	51			
4. School Management	Coefficient	0.292*	0.340*	0.425**	--		
	Sig.	0.038	0.015	0.002			
	N	51	51	51	51		
5. Teaching & Learning Resources	Coefficient	0.743**	0.500**	0.540**	0.316*	--	
	Sig.	0.000	0.000	0.000	0.024		
	N	51	51	51	51	51	
6. Teacher Housing	Coefficient	0.363*	0.127	0.243	0.244	0.151	--
	Sig.	0.038	0.483	0.173	0.172	0.402	
	N	33	33	33	33	33	33

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 6 shows the correlation matrix of the constructs of the newly designed BEJSS. Most of the constructs in the instrument have positive, statistically significant relationships except for the Teacher Housing construct, which only correlates significantly with the Physical School Environment. Most correlations ranged between moderate to strong, as expected from our design. Improvements in one aspect of teacher job satisfaction are likely related to other factors.

Discussion

The qualitative findings of our study revealed that teachers in senior secondary schools in the North-East region of Botswana were not content with the general working conditions and the physical environment of their schools. Teachers in the focus groups said they felt that the physical infrastructure could be more conducive to teaching and learning. Teacher participants felt that an acute resource shortage affected teachers' ability to provide quality education to learners. Teachers must be brought from far away to teach in remote rural areas and are therefore provided with accommodation by the school. However, the teachers were dissatisfied with the housing provided and felt that the school's failure to provide comfortable and adequate housing could be detrimental to their well-being, job satisfaction and productivity. Providing well-maintained and adequate school infrastructure, such as well-equipped classrooms, could lead to more favourable teaching and learning experiences for learners and teachers. Conducive working conditions and sufficient learning and teaching resources such as textbooks and computers are relevant for productive education and could improve teacher job satisfaction (Klassen et al., 2010).

Teacher participants furthermore said that accountability, autonomy and active engagement in decision-making would increase their job satisfaction, and Judge et al. (2020) had similar findings. In Botswana, teachers want more supervisory support, effective communication and transparency to improve their job satisfaction. Likewise, supportive, well-defined and clear school supervision structures were vital for effectiveness and improved results. Teachers in our study said they want the opportunity to be actively involved in school decision-making, which aligns with the literature found by Sims (2020). Alkhateri et al. (2018) also found supportive supervision closely related to improved teacher job satisfaction and performance. They highlighted a significant connection between comprehensive supervision structures and transparency and that such factors played a vital role in improving job satisfaction levels.

We found that teachers working in rural Botswana were satisfied with their job security as most were permanently appointed. Teachers, however, articulated that the permanent and pensionable employment status made some of them complacent at work. When job security is paired with incentives for performance, such complacency could be avoided. Job security is crucial for job satisfaction, and we detected this finding in international literature, for example, Ouyang et al. (2015), Arnup and Bowles (2016) and Dhamija et al. (2019). Combining job security with salary incentives emerged in our next theme as well, where teachers said their salary was rarely adjusted, leading to dissatisfaction. Periodical salary increments based on performance and teaching experience could stave off stagnancy in teacher motivation and improve overall mental well-being and satisfaction. Similar findings have emerged in Kenya (Muchai et al., 2018), Tanzania (Nyamubi, 2017) and Nigeria (Usikalu et al., 2015).

After developing and refining the items, we piloted with the relevant population. Our constructs showed adequate evidence of unidimensionality as well as good reliability indices. The items fit the Rasch model, with

only two items displaying misfit above the 1.5 cut-off value. We investigated the potential misfit and concluded that the items were still contributing to the construct and, therefore, should be retained. The Point-Measure correlations (PTMA) were all positive, as required, and we were satisfied that the items contributed to their latent traits (Combrinck, 2018). We detected only one item that displayed DIF, and we concluded that the item indicates true differences between male and female teachers, and currently, the item phrasing remains as it is. There are moderate to strong correlations among the constructs, as we would expect, and this further confirms our instrument hypothesis that all the constructs contribute to the overall idea of teacher job satisfaction. Only the Teacher Housing construct does not correlate with the other variables, which is as expected, as this is an outside-of-school factor.

Conclusions

Our study resulted in a newly developed 28-item survey measuring teacher job satisfaction. The current paper offers evidence that the instrument is internally reliable and valid. The BEJSS has five unidimensional constructs suitable for assessing teacher job satisfaction in Botswana. Constructs measured by the instrument include satisfaction with the following aspects: Physical school environment, School management, Teachers' accommodation or housing, Teaching and learning resources, and Remuneration. We included the Teacher's accommodation, which emerged as critical during the focus group discussions. Researchers could adjust the questionnaire to suit their unique settings; for example, they could opt to exclude the accommodation construct if the schools do not provide housing in their context. We suspect that this instrument could also be helpful for similar circumstances, for example, other countries where housing is provided in rural areas to draw in teachers from beyond the area.

Limitations of the study and Future research

We had a small sample for the quantitative piloting of the new instrument, and we only involved secondary school teachers in rural areas of North-East part of Botswana. The instrument would, therefore, require more piloting if applied in a context outside of Botswana. Our study was cross-sectional, which has its own limitations, and we suggest further research to establish temporal stability. We also note that the challenges teachers face in rural areas could differ from their urban counterparts. Hence, views from urban teachers are an area which requires further research. A more comprehensive study should be conducted in other parts of Botswana and in the broader Southern African contexts to analyse trends in teacher job satisfaction further.

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