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ROLE OF TEACHER AUTONOMY, SUPPORTIVE ENVIRONMENT, DISCIPLINE PROBLEMS AND JOB OVERLOAD AS PREDICTORS OF STEM TEACHERS' JOB SATISFACTION

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ABSTRACT

The issue of teachers' job satisfaction continues to receive growing attention in education but the effects of its predictive factors are inconsistent across disciplines and contexts. So far, limited studies have been conducted on TALIS 2018 data within the context of STEM teachers in Africa. Based on the job demands - resources model, factors such as teacher autonomy, supportive environment, discipline problems and job overload were examined. The regression analysis revealed that supportive environment and teacher autonomy positively predicted STEM teachers' job satisfaction. It further emerged that supportive environment is most important factor that contributes favourably to job satisfaction. Conversely, discipline problems and job overload were negatively associated with job satisfaction. The study found no significant differences in the job satisfaction between male and female STEM teachers. Findings provide new perspective on the status of job satisfaction among STEM teachers, indicating moderate job satisfaction arising from the available job resources.

KEYWORDS: Job demands, job resources, job satisfaction, supportive environment, teacher autonomy

INTRODUCTION

At present, teaching and learning in the science, technology, engineering and mathematics (STEM) discipline is a priority to many countries, more so developing countries where there are challenges in workforce retention in comparison to other disciplines. It is often the case that promoting STEM in these countries has been challenged by teacher shortages arising from low motivation, in-adequate professional incentives and imbalances in job satisfaction (Aldridge & Fraser, 2016; Liu et al., 2023). This backdrop of challenges has attracted few STEM graduates to the teaching profession and those in it face the possibility of shifting to other professions. If STEM teaching should be enhanced, the prevailing issues on teacher job quitting intentions need to be investigated and addressed. In this light, job satisfaction plays a pivotal role.

Moreover, the effective teaching of STEM subjects in schools particularly at the lower levels could

serve as a base where interest in the discipline is nourished. If learners receive foundational skills in STEM subjects at that stage of their education, it is possible that they would sustain interest to pursue careers associated to the disciplines. All of these depend on the availability of qualified and dedicated teachers (Cameron & Lovett, 2015). Without these teachers, the prospect of advancing STEM learning would be limited. So, one way of tackling these challenges is gaining an understanding of STEM teachers' job satisfaction and the factors that may positively or negatively influence their job satisfaction levels. Therefore, STEM teachers' job satisfaction remains paramount as a condition for effective teaching and learning of STEM subjects in schools. Previous studies have identified job demands and resources related factors as viable predictors of teachers' job satisfaction (Admiraal, 2022; Admiraal & Røberg, 2023; Jung, & Woo, 2022;). While some of the studies (e.g., Liu et al., 2022; Liang, 2023) have provided meaningful perspectives on teachers' job resources, demands and job satisfaction relationship through an analysis of TALIS (Teaching and Learning Survey) data, there is no study to the researchers' knowledge that has reflected on the Africa context. It is in view of these considerations that the current study focuses on STEM teachers at the lower secondary school level in South Africa using TALIS 2018 data.

The major problem that this study seeks to investigate is STEM teachers' job satisfaction. The overall job satisfaction level of teachers in South Africa is reported to be low (du Toit & de Klerk, 2023) which contrasts with what obtains from other TALIS nations (OECD, 2019). The education sectors of most African states face enormous challenges in the domain of STEM education. While STEM education continues to receive increasing attention, personnel issues have negated the gains made. These issues border on teacher attrition (Shibiti, 2020), which have had unfavourable impact on the education system in South Africa (du Toit & de Klerk, 2023). Moreover, teaching effectiveness in the STEM subjects is dismally appalling. More to it is the fact that studies have linked these issues to work dissatisfaction. Therefore, such challenges can be addressed with a focus on improving teachers' job satisfaction (Aldridge & Fraser, 2016; Liu et al., 2022).

Furthermore, there is little evidence to show that interventions exist to tackle challenges of teacher job satisfaction (du Toit & de Klerk, 2023). Essentially, an effective intervention could be conceptualized from the findings of this analysis. As this study seeks an exploration of factors associated with job satisfaction, a better understanding of STEM teachers' perception on the issue could be gained. Ultimately, a valid empirical evidence would be provided to inform policies, best practices and for possible interventions not only in South Africa, but including other countries across the horn of Africa.

The main purpose of this study is to analyse the 2018 TALIS data on South Africa to empirically establish the factors that have a bearing on STEM teachers' job satisfaction. The Republic of South Africa is the only country in the whole of Africa that participated in the 2018 TALIS survey. It is a largely multicultural nation with a diversified population that mirrors peoples of other parts of Africa. Therefore, the participation of South Africa in TALIS provides a unique picture of teaching and learning trends across other regions in Africa. Many other nations of the African continent are in need

of a similar high-quality data on education so as to inform policy formulation and best practices. With this limitation in data on education, an analysis of the South Africa TALIS data and results can accommodate generalisations to other African countries.

Research Questions

The following research questions guide this study:

1. To what extent are the dimensions of STEM teachers' job demands-resources and job satisfaction related?
2. Do autonomy, supportive environment, discipline problem and job overload predict STEM teachers' job satisfaction?
3. How significant is the relationship between STEM teachers' job resources and job satisfaction?
4. Are there gender differences in STEM teachers' job satisfaction?

Research Hypotheses

H 1: Job resources will be positively associated with job satisfaction of STEM teachers.

H 2: Job demands will be negatively associated with job satisfaction of STEM teachers.

H 3: Autonomy and supportive environment will predict STEM teachers' job satisfaction.

H_a 4: Discipline problem and job overload will predict STEM teachers' job satisfaction.

H 5: There will be a difference between the mean scores of male and female STEM teachers' job satisfactions.

LITERATURE REVIEW

Understanding the Role of Teachers' Job Satisfaction

Practically, job satisfaction denotes a pleasant feeling about one's work environment and conditions. This perspective finds support in the definition of Ainley and Carstens (2018) on teacher job satisfaction stating that it refers to "the sense of fulfilment and gratification that teachers experience through their work as a teacher" (p. 43). A possible interpretation arising from the definition is that teachers can be satisfied if the general conditions they work in meet their expectations on a regular and sustained basis.

There can be no doubt that an understanding of the nature and drivers of job satisfaction would guide school authorities to effect measures that enable good working environment for teachers. Thus, it is often claimed that teachers with high job satisfaction are very likely to remain committed and stay on in their jobs (Cameron & Lovett, 2015; Shaw & Newton, 2014). This highlights the significance of job satisfaction in view of the volatile situation of retaining STEM teachers in most developing countries. Dissatisfaction can arise when teachers do not appreciate the work environment, they find themselves.

Nonetheless, teachers should enjoy doing their work and be positive about being teachers. To put it another way, job satisfaction is determined based on how one feels about the school environment and the teaching profession, precisely. In sum, job satisfaction is essentially two dimensional; satisfaction towards the working environment and satisfaction towards the profession (Zachariya, 2020).

Dimensions of Job Demands and Job Resources that Predict Job Satisfaction

Previous studies on teachers' job satisfaction have noted the factors that improve or diminish the effects on job satisfaction. For instance, Admiraal and Røberg (2023) study of TALIS 2018 data on selected European countries identified school climate and collaboration factors as having a bearing on job resources whereas factors for job demands included professional development barriers and feeling of distress. These factors predicted varying degrees of perceived teachers' job satisfaction based on different working conditions.

Moreover, teachers' working conditions can induce either a negative or positive effect on job satisfaction (Admiraal, 2022; Han, et al., 2020; Van Droogenbroeck, & Spruyt, 2016). In an analysis of TALIS 2018 data on Shanghai, Liang (2023) showed that while job resources positively predict teachers' job satisfaction, in contrast, job demands do so negatively. This result agrees with the findings of Zhang and Duan (2023). In addition, Liang's study pointed out the role of the school environment factor. Also, it emphasized the need for schools to embrace best school management practices and pay more attention to a job resources-demands driven solution to job satisfaction issues among teachers. It is necessary to note that positive working condition relates to job resources factors such as autonomy and supportive environment (Olsen & Huang, 2019; Xia et al., 2023; In Admiraal & Røberg, 2023). On the other hand, working conditions with negative effects on teachers' job satisfaction are associated with job overload and student misbehaviour or discipline problems (Jackson & Stevens, 2023; Toropova et al., 2021; In Admiraal & Røberg, 2023).

With specific reference to STEM teachers' job satisfaction, all the evidence suggest that varying factors have been applied in an analysis of the effects that job resources and demands bear. Liu et al. (2022) undertook regression and commonality analysis of US TALIS 2018 data focussing on STEM teachers. While the result revealed the general effects of job resources, job demands and job self-efficacy on job satisfaction, it specifically highlights the outstanding contribution of job resources. Teacher autonomy, participation among stakeholders and School teacher–student climate were the composite factors of job resources in the study. This underlines the importance of optimizing work resources to improve STEM teachers' job satisfaction. However, any meaningful approach should consider a combination of both job resources and job demands. Perhaps, what should be of interest is the exploration of various factors that fit the job demands-resources concept.

The situation in South Africa suggests that there are low levels of job satisfaction among teachers (OECD, 2019). In a recent review of studies on teachers' job satisfaction in South Africa, du Toit and Klerk (2023) identified teacher workload, learners' behavior/discipline issues, resources limitations among others as some of the factors that account for low teacher job satisfaction. Furthermore, other

studies have found that declined school support and high workload contribute to the low teacher job satisfaction (Henson et al., 2015; Naidoo, 2019).

All the evidence from previous studies suggests that job satisfaction plays a pivotal role in education. While studies have used TALIS data to provide empirical evidence about the effect that job demands and resources factors bear on teacher's job satisfaction, there is obscurity on what obtains in the context of Africa. Therefore, this study sets out to address this existing gap in the literature in order to provide new perspectives on the interplay of job demands-resources relations with job satisfaction specifically on STEM teachers.

Theoretical Framework

This study is anchored on the job demands – resources (JD-R) model postulated by Demerouti et al., 2001, which provides an avenue for examining how demands and resources interact to facilitate positive job outcomes (Taris et al., 2017). The JD-R model has been widely applied in a range of occupational contexts to offer an insight into the relationship between employee demands, resources, and satisfaction. In essence, the balance between demands and resources is key to understanding employee satisfaction. Job demands are elements of work the require employees to exert physical, emotional or cognitive effort and are linked to consequences such as stress, burnout or dissatisfaction. On the other hand, job resources are aspects of the work environment that enable employees to minimize the impact of demands and boost their professional growth (Bakker & Demerouti, 2007; Demerouti et al., 2001).

In education, the JD-R model has attracted growing interest as a way of assessing teachers' job satisfaction and well-being (e.g. Admiraal & Røberg, 2023; Liu et al., 2022). Trends in the teaching profession reflect on how aspects of job demands such as workload, time constraint, and emotional pressures are expected to have a negative influence on job satisfaction. Conversely, job resources, such as, professional development and teacher autonomy are expected to enhance satisfaction and limits the negative effects of job demands. STEM teachers are prone to substantial demands and uneven access to resources. Therefore, the JD-R framework assumes practical importance and application in this context because it explains why educators experiencing heavy workloads and discipline problems are more likely to be dissatisfied, while those with autonomy and environmental support tend to remain engaged and satisfied.

The theoretical framework provides the foundation for the study's conceptual model and is represented in the diagram below.

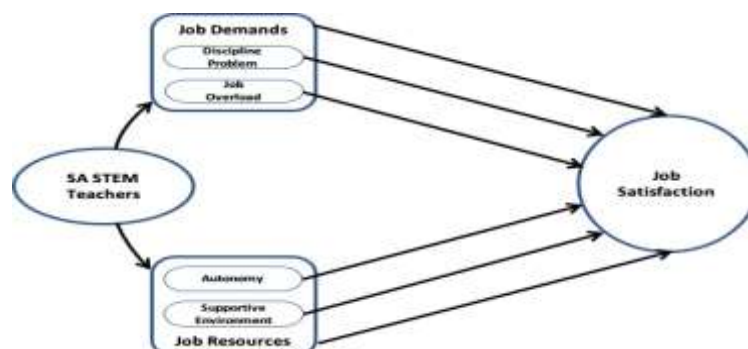


Figure 1: Study model

MATERIALS AND METHODS

Source of Data and Procedure

Data for this study was derived from TALIS-2018 Survey database with specific focus on South Africa. The TALIS survey is conducted periodically to capture relevant education data from over 50 participating countries around the world through the support of the Organization for Economic Co-operation and Development (OECD). Based on the 2018 survey, both school principals and teachers were captured in the study. TALIS seeks to make available “robust international indicators and policy relevant analysis on teachers and teaching in order to help countries review and develop policies that promote conditions for effective teaching and learning” (Ainley & Cartens, 2018, p. 8).

The study sample was drawn from lower secondary STEM teachers in South Africa based on the TALIS dataset. In order to select the identified sample, due consideration was given to the TALIS teacher questionnaire and its items. Firstly, SPSS was used to identify and select South Africa as a case with country number 710. Secondly, another round of case selection was executed to extract data specific to STEM teachers in the South Africa TALIS 2018 data. To achieve this, subject categories in item TT3G37 (Into which subject category does this target class primarily fall?) were screened and categories 2, 3 and 7 selected thus providing a representative sample of STEM teachers. In all, the sample consisted of 674 STEM teachers including 399 females and 275 males. The table below presents a descriptive statistic of the study sample.

Table 1: Data on STEM teachers

Primary subject category	Gender		Total
	Female	Male	
1. Mathematics Includes mathematics, mathematics with statistics, geometry, algebra, etc	192	150	342
2. Science Includes science, physics, physical science, chemistry, biology, human biology, environmental science, agriculture	145	71	216
3. Technology Includes orientation in technology, including information technology, computer studies, construction/surveying	62	54	116
Total	399	275	674

Variables and Measures

The studies of Liu et al. (2022) on STEM teachers in the US and Zachariya (2020) largely guided the selection of data. Based on a review of the two studies, the variables of job resources, demand and job satisfaction as well as their measures were identified in the TALIS 2018 teacher questionnaire (OECD, 2018).

Job satisfaction

With respect to the dependent variable, job satisfaction, eight items were initially considered based on Zachariya (2020) findings (TT3G53A, TT3G53B, TT3G53D, TT3G53E, TT3G53F, TT3G53G, TT3G53I and TT3G53j). To yield high scale reliability, items TT3G53B and TT3G53F were reversed coded. Following administration of factor analysis, item TT3G53A was extracted for falling below the 0.5 factor-loading threshold. Thereafter, a new variable Job_Sat was created consisting of the seven items producing a high Cronbach's alpha score of 0.805 (Table 2).

Job resources

Furthermore, two new variables were created and added to the existing list. These include; autonomy (TT3G40B, TT3G40C, TT3G40E) and supportive environment (TT3G48A, TT3G48E, TT3G48F) which emerged as suitable variables to measure job resources indicating strong factor loading and Cronbach's alpha score (see Table 2).

Job demand

In addition, a second set of new variables was created to measure job demand. These are discipline problem (TT3G41A, TT3G41C, TT3G41D) and job overload (TT3G52A, TT3G52B, TT3G52C).

Table 2: Mean, standard deviation, Cronbach's alpha, factor loading of variables

Variable	M	SD	Cronbach's	Item	Factor
			Alpha	Code	Loading
Job satisfaction	20.514	4.254	.805	TT3G53 B	0.823
				TT3G53D	0.710
				TT3G53E	0.647
				TT3G53F	0.669
				TT3G53G	0.674
				TT3G53I	0.534
				TT3G53J	0.538
Job resources					
Autonomy	10.074	1.414	.765	TT3G40B	0.764
				TT3G40C	0.842
				TT3G40E	0.795
Supportive environment	8.270	1.986	.819	TT3G48A	0.815
				TT3G48E	0.840
				TT3G48F	0.724
Job demands				TT3G41A	0.851
Discipline problem	7.024	2.622	.894	TT3G41C	0.869
				TT3G52A	0.884

Job overload	7.690	2.621	.813	TT3G52B	0.819
				TT3G52C	0.889
				TT3G40B	0.835

While some of the variables have been previously used (Liu et al., 2022), the supportive environment variable and items have been constituted exclusively for this study. Interestingly, each of the scales showed a heavy loading and high Cronbach's Alpha value (table 2).

Statistical Analysis

The Statistical Package for Social Sciences (SPSS) was employed for data analysis. In a bid to answer the research questions and test the study hypothesis, correlation analysis, independent samples t-test and multiple regression analysis were performed. For research question 1, the relationship between the study variables was explored with a Pearson correlation analysis. An independent samples t-test was performed for research question 2 with specific focus on how gender differences define the relationship between the variables.

To address research questions 3 and 4, both linear and multiple regression analysis were carried-out, respectively. The analysis focused on the dependent variable, job satisfaction and the specific independent variables representing job demand and job resources; autonomy, supportive environment, discipline problems and job overload.

Considering the sample size, a determination of its suitability was made based on Khamis and Kepler (2010) criteria for multiple regression and supported by Fidel (2019); $n \geq 20 + 5 \times m$, with m representing the number of variables. Considering these criteria, the regression requires a sample of 150, and our selected sample of 674 far exceeds the threshold.

Also, the researcher addressed the effects of missing data on the analysis. This was achieved by activating the "Exclude cases listwise" command to ensure that only cases without missing values are used in the regression analysis. Eventually, the number of cases reduced to 618 cases after exclusion of missing cases. In addition, necessary assumption tests were done and checked before for t-test and regression analysis. The outputs showed that the study data meet all of the assumptions. For instance, the Durbin-Waston score (1.886) of the multiple regression confirms independence of observation.

RESULTS

The Associations between STEM Teachers' Job Demands-Resources and Job Satisfaction

The first research question seeks to unravel paths in the relationships between STEM teachers' job resources, demand and job resources. Results of the Pearson correlation analysis revealed positive associations between job satisfaction and job resources factors; autonomy but a negative one with job

demand factors. The records in table 3 showed that association between job satisfaction and the job resources factor, autonomy is relatively low ($r = 0.229$) whereas the other job resources factor, supportive environment is very high ($r = 0.480$). Furthermore, results on job demands revealed negative associations for both factors as that for discipline problems (-0.383) is moderate and job overload (-0.179) is very low.

Table 3: Correlation analysis of variables

Variables	JS	JR 1	JR2	JD 1	JD 2
J S	1				
JR 1	.229**	1			
JR 2	.480**	.170**	1		
JD 1	-.383**	-.244**	-.333**	1	
JD 2	-.179**	-.166**	-.033	.212**	1

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

Do Autonomy, Supportive Environment, Discipline Problem and Job Overload Predict STEM Teachers' Job Satisfaction?

To address research question 2, a multiple regression analysis was done reflecting on the extent to which job resources and demand factors predicted STEM teachers job satisfaction. The significant correlation between variables confirms that the study variables are suitable for regression analysis.

The results revealed a significant regression effect based on the emerging model, $F(4, 613) = 68.126$, $p < .01$, $R^2 = (.308)$. By and large, the study model underscores 31% of the variance in STEM teachers' job satisfaction.

Further exploration of the performance of each of the predictors showed a consistent picture of their significant predictive effect. Evidently, STEM teachers' job satisfaction was significantly predicted by each factor; autonomy ($t = 2.68$, $p < .01$), supportive environment ($t = 10.93$, $p < .001$), discipline problem ($t = 5.59$, $p < .001$) and job overload ($t = 3.06$, $p < .01$). Notably, the predictions by the job resource factors and job demands factors are positive and negative, respectively.

Table 4: Multiple regression models predicting STEM teachers' job satisfaction

Variable	B	Std. Error	β	t	P
Autonomy	.280	.104	.094	2.68	.007
Supportive environment	.809	.074	.392	10.93	.000
Discipline problem	-.328	.059	-.207	5.59	.000
Job overload	-.166	.054	-.106	3.06	.002

$R^2 = .308$ $R^2_{adj} = .303$ ($N=618$, $P = .000$)

On the basis of the interpretation of results, the regression is significant. However, based on the coefficient values suggesting both positive and negative effects, null hypothesis 3 is rejected and null hypothesis 4 is accepted. Furthermore, a suitable model is derived as represented by the regression equation:

The model emanating from this multiple regression analysis is as follows:

$$\text{Model: } Job_Sat = (14.49) + (.280) + (.809) + (-.328) + (-.166) \times 4$$

How Significant is the Relationship between STEM Teachers' Job Resources and Job Satisfaction?

Based on research question 3, a simple linear regression analysis was executed to bring out the linear relationship between job resources and job satisfaction among STEM teachers. The result underscored a significant regression $F(1, 619) = (191.46)$, $p = (< .001)$. This means that a linear relationship exists between job resources and job satisfaction. Moreover, the resulting R^2 value (.24) indicates that job resources account for (24%) of the variance in job satisfaction. Therefore, the study regression model would precisely be:

$$(\text{Job satisfaction}) = (6.344) + (0.767) (\text{Job resources}).$$

Table 5: Regression model of the effect job resources on job satisfaction among STEM teachers (N=618)

Variable	B	R ²	Df	F	P value
Job satisfaction	6.344	.24	1, 619	191.46	.000 ^b
Job resources	.767				

From the interpretation above, it is agreeable that job resources invariably exert a significant effect on job satisfaction among STEM teachers. Therefore, null hypothesis is rejected and the alternate hypothesis accepted.

Are there Gender Differences in STEM Teachers' Job Satisfaction?

To address research question 4 and its corresponding hypothesis, an independent sample t-test was done to compare differences in the mean scores between male STEM teachers and female STEM teachers' job satisfaction. The results (Table 4) showed that there is equal variability in the mean scores of job satisfaction $t(630) = -.978$, $p = .328$ as mean scores of male STEM teachers (**M=20.71, SD = 4.08**) are almost at equilibrium with female STEM teachers (**M=20.38, SD = 4.37**). This suggests that mean scores do not have a significant difference and that the level of perceived job satisfaction for both male and female STEM teachers does not differ much. Therefore, the null hypothesis is accepted and the alternate hypothesis rejected.

Table 3: Independent samples t-test of STEM teachers' job satisfaction differences based on gender

	Male		Female		Df	T	Sig. (2tailed)
	M	SD	M	SD			
Job Satisfaction	20.71	4.08	20.38	4.37	630	-.978	.328

The findings here suggest that there is equilibrium in terms of STEM teachers' job satisfaction for both males and females. The conditions that influence job satisfaction are the same for male and female teachers.

DISCUSSION

Effects of Autonomy and Supportive Environment on Job Satisfaction of STEM Teachers

Based on the findings emanating from a regression analysis of TALIS 2018 STEM teachers perception in South Africa, the study's job resources factors, autonomy and supportive environment, positively predicted job satisfaction. This conforms to the pathway of the JD-R model, indicating that job resources do not only boost engagement but also diminish the negative effects of job demands. The finding is consistent with that obtained in the studies of Liang (2023) and Han, et al. (2020). It is explicit that teachers in South Africa generally have low job satisfaction. Against this background, teachers' supportive environment stands out prominently as imposing a stronger effect in predicting job resources. This highlights the importance of creating opportunities for teacher support interventions in order to consolidate the already existing supportive structures in the schools. Attention could be placed on school support such as that from school leaders, colleague teachers and the general working conditions.

In terms of teacher autonomy, the findings showed that despite its positive prediction of STEM teachers' job satisfaction, the effect is not as high as supportive environment. This calls for more attention to be given to improving on school practices and policies that may provide teachers with more autonomy. By and large, higher levels of job resources create room for improved job satisfaction.

On the other hand, the regression results showed interesting picture of the interplay between job demands and job satisfaction. While STEM teacher' job demands significantly predicted job satisfaction, the relationship is rather negative. This result also finds support in previous studies (Jackson & Stevens, 2023; Toropova et al., 2021). Perhaps, the reported general low level of job satisfaction is attributable to the prevailing job demands on STEM teachers in South Africa. This may not be unconnected to the negative effects of teacher attrition highlighted in the study of du Toit and Klerk (2023),

Effects of Job Overload and Discipline Problems on Job Satisfaction of STEM Teachers

The current study focused on job overload and discipline problems as factors explaining STEM teachers' job satisfaction. Obviously, it is expected that teacher attrition may give rise to teacher shortage, as is the case for teachers of STEM. In such a situation, the few teachers available are unavoidably faced with higher workload, which directly impacts negatively on job satisfaction (Naidoo, 2019). Discipline problems is linked to learners' misbehavior. It also contributes to STEM teachers' job satisfaction, though negatively. Be as it may, the findings showed that STEM teachers in South Africa are confronted by discipline challenges from their students. This can be a source of dissatisfaction and ineffectiveness in the profession. Thus, a reason why the general job satisfaction of teachers in South Africa is low.

Results from the correlation analysis provide evidence on the strong association between STEM teachers' job demands, resources and job satisfaction. This means that support for STEM teachers' job satisfaction must feed into their job demands and job resources needs. Interestingly, the independent samples t-test revealed that both male and female STEM teachers do not differ on their level of job satisfaction. Therefore, the gender issue is not a factor that should warrant concern in terms of STEM teachers job satisfaction.

CONCLUSION

This study on STEM teachers' job demands, resources and job satisfaction sheds light on the situation in the context of Africa. Based on the results of an analysis of the TALIS 2018 data, STEM teachers' supportive environment provides the strongest indication of their job satisfaction. The regression analysis provided support that despite the generally low job satisfaction, job demands and resources are significant predictors of STEM teachers' job satisfaction. However, the negative effect of the relationship is prominently highlighted. In addition, gender differences do not have an effect on STEM teachers' job satisfaction. Though the study is limited to STEM teachers, its findings provide basis for generalisations and construction of interventions to scale up STEM teachers' job satisfaction in a developing country context.

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