



WORKLOAD AND WITHIN DAY CHANGES IN ATTENTION PERFORMANCE AMONG PRIMARY SCHOOL TEACHERS IN TASHKENT

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Abstract

Background: Primary school teaching includes classroom instruction, lesson preparation, marking and electronic reporting. These activities may extend occupational demands beyond scheduled lessons.

Objective: To describe reported workload and within day changes in attention performance among primary school teachers in Tashkent.

Methods: Aggregate questionnaire, time observation and functional assessment findings were extracted from Nigmatullayeva's 2025 dissertation. Attention was assessed using Anfimov letter tables before and after teaching. The article reports source means, source reported significance levels and descriptive changes calculated from those means.

Results: The dissertation describes total daily work of approximately 9–11 hours. The mean number of reviewed characters fell from 766.2 to 686.7, while total errors increased from 6.1 to 8.2. The productivity coefficient declined from 70.9 to 61.8; the source reported $p < 0.01$ for these comparisons. In a separately described cardiovascular subset of 136 teachers, mean pulse rose from 70.6 to 78.1 beats per minute.

Conclusions: The findings are consistent with accumulating functional fatigue over the teaching day. They support a fuller assessment of total workload and opportunities for recovery, but do not demonstrate causation or intervention efficacy.

Keywords: Primary school teachers; occupational workload; attention; functional fatigue; work organization; prevention



Introduction

Scheduled classroom teaching does not capture the full working day of a primary school teacher. Preparation of learning materials, checking notebooks, communication and electronic reporting may continue after lessons. Assessing workload only through classroom hours can therefore underestimate the time during which teachers remain engaged in demanding tasks.

Occupational fatigue is relevant when work performance changes during the day. Letter cancellation tasks provide information about processing volume and accuracy, although their interpretation depends on standardized administration and individual factors. A decline in task performance cannot by itself diagnose burnout or neurological disease.

WHO guidance on mental health at work includes organizational approaches to workplace risks [2]. The WHO and ILO policy brief also provides a framework for implementing preventive measures [3]. These sources support examining working conditions alongside individual coping strategies; neither establishes that a specific workload caused the changes observed in the present teachers.

The aim was to characterize reported daily workload and summarize before and after teaching changes in attention performance and pulse in the dissertation's primary school teacher population.

Materials and methods

Design and source. This descriptive article draws on the occupational workload and functional assessment sections of Nigmatullayeva's dissertation [1]. The broader research programme concerned primary school teachers in Olmazor and Mirzo Ulugbek districts of Tashkent. Questionnaire and functional assessment components were reported with different sample sizes and were not treated as one fully linked cohort.

Workload assessment. The source describes direct observation of work activities and questionnaires addressing lesson preparation, notebook marking and electronic assessment. Scheduled instruction was approximately four or five hours per day on five school days per week. Total work time was reported as approximately 9–11 hours daily when additional duties were considered.



Attention assessment. Anfimov letter tables were used to assess work productivity and stability of attention before and after teaching. The extracted indicators were reviewed characters, total errors, differentiation errors and the productivity coefficient. The denominator for the attention testing subset was not clearly established in the available reporting; no participant count is assigned to that component here.

Cardiovascular assessment. The dissertation separately describes 136 teachers assessed during the working day. Pulse and blood pressure were measured before lessons, after lessons and at the end of the day. This article reports pulse means from the source table; it does not add a new hypertension analysis.

Analysis. Published aggregate means and $M \pm m$ values were retained. Absolute and percentage changes were calculated as post teaching minus pre teaching values and as that difference divided by the pre teaching mean. These calculations are descriptive and are not standardized effect sizes. Reported p values belong to the dissertation and were not independently recalculated. Ethics approval and consent details for the original research require author verification before submission.

Results

The dissertation reports that 47.6% of teachers spent up to two hours on lesson preparation, 33.3% spent two to three hours and 19.1% spent at least three hours. Notebook marking required one to two hours for 50.4%, two to three hours for 37.1% and at least three hours for 12.5%. These distributions describe separate activities and should not be summed to estimate the workload of an individual teacher.

The reported extension of daily work to 9–11 hours included tasks beyond scheduled instruction. These values are approximate source estimates rather than continuously logged working hours for every participant. The source also describes electronic reporting as an additional demand, highlighting the need to assess how classroom and administrative tasks accumulate.



Table 1 Attention task performance before and after teaching

Indicator	Before M ± m	After M ± m	Change	Source p
Reviewed characters	766.2 ± 11.3	686.7 ± 10.1	-79.5	<0.01
Total errors	6.1 ± 0.37	8.2 ± 0.45	+2.1	<0.01
Differentiation errors	3.9 ± 0.37	5.5 ± 0.33	+1.6	<0.01
Productivity coefficient	70.9 ± 1.1	61.8 ± 1.03	-9.1	<0.01

Reviewed characters decreased by 10.4%, and the productivity coefficient decreased by 12.8%. Total errors increased by 34.4%, while differentiation errors increased by 41.0%. These percentages summarize changes in group means and do not indicate that each teacher experienced the same change. Both processing volume and accuracy worsened in the reported summaries.

The dissertation states that reviewed characters decreased in 90.6% of tested teachers and that errors increased in 98.5%. As the testing denominator is unclear, these proportions are presented as source reported findings without reconstructing counts or calculating confidence intervals.

In the cardiovascular subset, the source table reports pulse means of 70.6 ± 0.73 beats per minute before work and 78.1 ± 0.72 afterwards, with $p < 0.01$. Subtracting these means gives an increase of 7.5 beats per minute. The narrative instead states 7.3 ± 0.20 ; that discrepancy requires checking against original records. The before and after means are retained here, without treating either change estimate as independently verified.

Discussion

The joint decline in processing volume and accuracy is consistent with increasing functional fatigue during the teaching day. A reduction in reviewed characters alone could reflect a more cautious response strategy. Here, errors increased while reviewed volume fell, making the pattern relevant to a broader assessment of sustained attention.



The workload findings show why teaching contact hours should be supplemented with preparation and reporting time. Nevertheless, the aggregate data do not link each teacher's workload duration to that teacher's attention result. They cannot establish a dose response relationship or distinguish the contribution of marking, classroom instruction and electronic tasks.

Potential alternative explanations include insufficient sleep, baseline health, medication, time of day, hydration and testing conditions. None could be controlled using the available summaries. Pulse changes are similarly nonspecific and may reflect movement, emotional demands or other influences. They should not be interpreted as proof of cardiovascular damage.

Preventive planning can address work organization by allocating realistic time for preparation and marking, reducing duplicate reporting, providing recovery opportunities between demanding activities and arranging access to occupational health support. These measures are consistent with the organizational emphasis of WHO workplace guidance [2,3]. Their effectiveness in these schools remains to be evaluated.

A future evaluation should record participant flow, activity specific working time, sleep and health covariates and standardized attention testing conditions. Paired participant data would permit estimation of mean differences with confidence intervals and assessment of missing observations. School level clustering should also be considered.

The analysis is limited by uncertain denominators, incomplete documentation of the statistical tests and lack of raw paired observations. One attention coefficient is duplicated in the source narrative; the corresponding table was used because it supplies distinct before and after values. The pulse change also differs between table and narrative. These issues constrain numerical precision and should be resolved before journal submission.

Conclusion

Reported attention performance deteriorated from the beginning to the end of teaching, with fewer reviewed characters, more errors and a lower productivity coefficient. Preparation, marking and reporting extended work beyond classroom



hours. The findings support assessment of total workload and recovery opportunities, while participant level analysis is needed to determine which occupational factors contribute most strongly to fatigue.

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