TRACEABILITY OF THE IMPACT OF MUSICAL AND COMPUTER TECHNOLOGIES ON THE FORMATION OF FUTURE MUSIC TEACHERS' PROFESSIONAL COMPETENCE

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Introduction

For further development of the theoretical framework of the higher school an aspect of the empowerment of the author's mathematical model [1] becomes more important regarding traceability of the impact of musical and computer technologies (MCT) components on the formation of future music teachers' (FMT) professional competence in the form of the complete differential dF in partial derivative $\partial F/\partial X_i$ due to X_i – influence functions of the use of instruments of musical and computer technologies, which takes the general form:

$dF = \Sigma_i\, [(\partial F/\partial X_i)dX_i]$, where dX_i – finite increment functions X_i.

Results and Interpretation

Traceability of the impact on the pedagogical process of formation of pedagogical competence of FMT by MCT instruments starts from influential factors (X_I) instruments from MCT – functions X_0, covering factors: X_{01} - functionality of the MCT instruments; X_{02} – quality indicators of software instruments; X_{0n} – other factors of instruments. X_1 comes the next - the impact of student mastery of MCT instruments, factors: X_{11} – individual capacity; X_{12} – the student's master degree of the instruments; X_{1m} – other factors of student's MCT knowledge. X_2 is traced then - the practical impact of student's work on formation of competence, factors: X_{21} – achieving of the artistic mastery of FMT games, singing, conducting; etc., X_{22} – achievement of technical skill of FMT games, singing, conducting; etc., X_{2k} – other factors of the student's practical work of forming elements of professional competence through MCT. The whole process of traceability of the formation of each individual component of competence F are shown in this table

X_0				→	X_1				→	X_2				→	F
↑ X_{01}	↑ X_{02}	↑ ⋮	↑ X_{0n}		↑ X_{11}	↑ X_{12}	↑ ⋮	↑ X_{1m}		↑ X_{21}	↑ X_{22}	↑ ⋮	↑ X_{2k}		

With the influence functions which are shown in the table, the model has the form

$$dF = (\partial F/\partial X_0)dX_0 + (\partial F/\partial X_1)dX_1 + (\partial F/\partial X_2)dX_2$$

The finite increment of functions: X_0, X_1, X_2 is also possible to express it as complete differential in partial derivative:

$$dX_0 = (\partial X_0 / \partial X_{01})dX_{01} + (\partial X_0 / \partial X_{02})dX_{02} + \ldots + (\partial X_0 / \partial X_{0n})dX_{0n};$$
$$dX_1 = (\partial X_1 / \partial X_{11})dX_{11} + (\partial X_1 / \partial X_{12})dX_{12} + \ldots + (\partial X_1 / \partial X_{1m})dX_{1m};$$
$$dX_2 = (\partial X_2 / \partial X_{21})dX_{21} + (\partial X_2 / \partial X_{22})dX_{22} + \ldots + (\partial X_2 / \partial X_{2k})dX_{2k}.$$

Taking into account the relative increment of the following functions in time $d\tau$, after obvious transformations the mathematical model represents the form of the partial differential equation.

$$dF = \sum_{i=1}^{n}\left(\frac{\partial X_0}{\partial X_{0i}}\right)\left(\frac{\partial X_{0i}}{\partial \tau}\right)d\tau + \sum_{i=1}^{m}\left(\frac{\partial X_1}{\partial X_{1i}}\right)\left(\frac{\partial X_{1i}}{\partial \tau}\right)d\tau + \sum_{i=1}^{k}\left(\frac{\partial X_2}{\partial X_{2i}}\right)\left(\frac{\partial X_{2i}}{\partial \tau}\right)d\tau.$$

Conclusion

The mathematical model allows to investigate the influence of musical and computer technologies for each component of professional competence separately, and also to investigate the traceability of an unlimited number of influential factors in the pedagogical process of formation of future music teachers' professional competence.

Bibliography

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