MONITORING OF PROFESSIONAL COMPETENCE ACQUISITION BY FUTURE MUSIC TEACHERS

Zavgorodniy P.O.

Ukraine, Kharkov, Municipal Establishment Kharkov Humanitarian – Pedagogical Academy of the Regional Council

Introduction

In the process of formation of future music teachers' (FMT) professional competence at higher education institutions through application of musical and computer technologies (MCT) components, the practical aspect of the step-by-step monitoring of increase in the level of student's professional competence $\Delta \boldsymbol{F}$ over a certain period of the study time $\Delta \boldsymbol{\tau}$ takes on critical importance for the educators.

Results and Interpretation

Taking into consideration the didactic laws describing the pedagogical process as specified in [1], the problem of monitoring in general is addressed by solving the differential equation of complete differential $\boldsymbol{dF}$ in partial derivative

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

where: $\boldsymbol{X_i}$ — influence functions of the use of instruments of musical and computer technologies, $\boldsymbol{dX_i}$ – finite increment functions $\boldsymbol{X_i}$; $\boldsymbol{X_{01}}$ - functionality of the MCT instruments; $\boldsymbol{X_{02}}$ – quality indicators of software instruments; $\boldsymbol{X_{0n}}$ – other factors of instruments. $\boldsymbol{X_1}$ comes the next - the impact of student mastery of MCT instruments, factors: $\boldsymbol{X_{11}}$ – individual capacity; $\boldsymbol{X_{12}}$ – the student's master degree of the instruments; $\boldsymbol{X_{1m}}$ – other factors of student's MCT knowledge. $\boldsymbol{X_2}$ is traced then - the practical impact of student's work on formation of competence, factors: $\boldsymbol{X_{21}}$ – achieving of the artistic mastery of FMT games, singing, conducting; etc., $\boldsymbol{X_{22}}$ – achievement of technical skill of FMT games, singing, conducting; etc., $\boldsymbol{X_{2k}}$ – other factors of the student's practical work of forming elements of professional competence through MCT.

It is worthwhile noting that partial derivatives $\partial X_{0i}/\partial\tau$, $\partial X_{1i}/\partial\tau$, $\partial X_{2i}/\partial\tau$, reflect the functions of the student's individual speed of educational content learning, and $\partial X_0/\partial X_{0i}$, $\partial X_1/\partial X_{1i}$, $\partial X_2/\partial X_{2i}$ are functions of the change in the competence components importance in relation to the total increment $\Delta \boldsymbol{F}$**.** Assuming that $\Delta\tau$ is a rather small value in relation to $\Delta \boldsymbol{F}$**,** the speed of student's learning of an educational material may be approximated by linear functions with appropriate values: $\boldsymbol{V_{0i}}$ **,** $\boldsymbol{V_{1i}}$ **,** $\boldsymbol{V_{2i}}$**,** while the functions of the importance of the competence components correlation within $\boldsymbol{F}$ – by constant coefficients: $\boldsymbol{K_{0i}}$, $\boldsymbol{K_{1i}}$, $\boldsymbol{K_{2i}}$**.** Given the above, (1) becomes a comprehensible and practical formula to monitor the pedagogical process of learning

$$\Delta F = \sum_{i=1}^{n} (K_{0i} \times V_{0i}) \Delta\tau + \sum_{i=1}^{m} (K_{1i} \times V_{1i}) \Delta\tau + \sum_{i=1}^{k} (K_{2i} \times V_{2i}) \Delta\tau. \quad (2)$$

Where monitoring involves continuous lengthy learning periods, the natural decline in the speed of student's learning of an educational material due to fatigue should be taken into account, for instance, at the end of a lesson or lecture. This decline, in our opinion, is characterized by the natural logarithm law in the $\Delta\tau \geq 1$ area. Under this assumption, the formula for monitoring acquires an easy-to-use form:

$$\Delta F = \sum_{i=1}^{n} \left(K_{0i} \times V_{0i} \frac{1}{X_{0i}} \right) \Delta\tau + \sum_{i=1}^{m} \left(K_{1i} \times V_{1i} \frac{1}{X_{1i}} \right) \Delta\tau + \sum_{i=1}^{k} \left(K_{2i} \times V_{2i} \frac{1}{X_{2i}} \right) \Delta\tau. \quad (3)$$

Conclusion

This paper provides easy-to-use and practical formulae to monitor the pedagogical process of acquiring professional competence by the future music teachers at higher education institutions when applying components of musical and computer technologies.

Bibliography

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