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THE PEDAGOGICAL ADDED VALUE OF AN EU PROJECT

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ABSTRACT: One of the best tools to achieve this basic EU element is the Lifelong Learning Programmes, i.e. the Leonardo da Vinci Partnerships (LdVP). The University of Szeged, Hungary, the Technical Academy of Weilburg, Germany and the Vocational Training Center of Mus, Turkey designed a “Mechatronics Sustainability” project for the mechatronics model development and its integration into their countries’ study programmes under the LdVP. The target group of the project consists of mechatronics lecturers/teachers and students/pupils whose experience is related to this international project. Since our project is about mechatronics, the question is how to develop it (i.e. mechatronics) and integrate it into the curriculum of different types of vocational education; and since we have project partners from Germany, Turkey and Hungary, we can see cultural and pedagogical differences and the common future of high quality education as well.

KEYWORDS: European labor mobility, mechatronics

INTRODUCTION

Building up the European labor mobility is not only very important but also a basic element of the European Constitution. Thus the transparency of educational courses and the acceptance of educational achievements are additional important features here. As there are no borders for mobility, the comparability of educational achievements, foreign-language proficiency, a the key to success, and work experience abroad are becoming more and more important. Companies generally need a uniformity of documents throughout Europe to promote a much better understanding and more transparency. One of the best tools to achieve this basic EU element is the Lifelong Learning Programmes, i.e. the Leonardo da Vinci Partnerships (LdVP).

PEDAGOGICAL BACKGROUND

According to the literature, education is a preparation to live, work, learn and develop as a member of society and as a representative of a particular culture. This preparedness is based on understanding this culture. In other words – the preparedness of each of us to cope in society is based first of all on our cultural background, i.e. what kind of understanding we have of values, norms, what is our way of living, etc. (Urdze, T. 2003). Thus, education cannot be either bad or good, education can only be sufficient or insufficient for coping in society.

The necessary preparedness is like a certain period’s cross-section of norms, values, required skills and knowledge, etc. It is clear that the preparedness that was required ten years ago is not sufficient today, let alone in ten years’ time.

When we are talking about preparedness in case of mechatronics or generally about vocational education, we have to go back to the concept of education. If we claim that education is a sequence of constantly changing states of preparedness, then we are talking about a dynamic approach to education. If we want to find out what preparedness consists of, should do we approach the issue according to the static approach to education?

There are two examples for the interesting disquisition connecting to our work.

In Hungary, in 2003 a team attempted to measure certain pedagogical added values. In this investigation, they wrote: “the pedagogical added value consists of an estimated performance index based on the socio-cultural and socio-economical factors (EPI) most relevant to the students of the school, and the de facto results of the measurement” (Magyar, 2004).

In Finland, at the University of Tampere, Nokelainen and al. examined the criteria of the pedagogical usability. They determined the 10 following components (Nokelainen, 2006):

1. Learner control,
2. Learner activity,
3. Cooperative/Collaborative learning,
4. Goal orientation,
5. Applicability,

6. Added value,
7. Motivation,
8. Valuation of previous knowledge,
9. Flexibility
10. Feedback

Which competencies do we need to develop?

- Knowledge and skills. None of these has a meaning on their own for preparedness as a whole. It is their unity that is significant, i.e. knowledge has value only in case some skills come along for implementing this knowledge. And the other way around – there is nothing to do with very good technical skills if no knowledge follows.
- Position and behavior. This presumes a very precise understanding of the role and behavior according to the role. A teacher is able to appear in his/her (i.e. in a teacher's) role only when the student is able to appear in his/her i.e. in a learner's role. In other words – to be a teacher, there has to be something to learn from that teacher.
- Comprehension and understanding. To take part in the process it is necessary to understand what kind of process one is dealing with. For managing something it has to be understood what is being managed, whether it is possible to be managed at all. People and their behavior have to be understood as well. (Eesmaa, I. 2003)

Knowing the past and foreseeing the future. It is not possible to foresee the future without knowing the past. Without foreseeing the future no responsibility can arise, as responsibility is a decision-making based on results. The results of one's decision-making have to be foreseen.

MATERIAL AND METHODS

During the investigation stage information was gathered and summarized according to a qualitative investigation method:

- by interviewing teachers
- by summarizing information with a questionnaire.

The target group was teachers taking part directly or indirectly in our Leonardo da Vinci mechatronics project. The answerers filled in the questionnaires during project meetings in Weilburg, Szeged and Mus. 80 filled in questionnaires arrived. All the three partner countries' representatives completed them. There were 20 questions to answer.

THE RESULTS OF THE QUESTIONNAIRE

To show the results, we present the answers in succession.

Do you have in your school mechanical subject(s)? Everybody answered yes, which means in each partner school there is minimum one subject belonging to mechanical topics.

Do you have in your school electrical subject(s)? We got 80 'yes' answers again. It is very good and important, because both subjects are the prerequisites of teaching mechatronics. It is an important start pointing of our common project.

Next question is about how it is realized in the curriculum? Do your learners have any pre-knowledge about mechatronics? The answers varied. The 50% 'yes' and 50% 'no' means education focus on it to a little extent. The goal of our project is exactly this: to develop and integrate mechatronics into curriculum.

The answers to the following two questions are not conclusive. Do you teach mechatronics integrated in different vocational courses? It was interesting because we got 80 yes's but in the next question we did not get how it was realized. There were possibilities to choose from a) a theoretical subject b) training in workshop or c) both of them. Only 30 answerers crossed 'both of them', others did not.

We tried to analyze background and facilities. Do you have high quality, modern facilities to teach mechatronics? 33 answerers think they have but 47 answered 'no'. There is also a gap between teaching and the suitable equipment. It is necessary to develop or invest. When we asked about the cooperation with companies having facilities for the students to do practice there, 75 answerers crossed 'no', so there is no workshop training in these cases. 5 teachers answered there is no use to have companies for practice. The crucial aspect of vocational education is the acceptance of the output by the labor market. Is there any labor market demand for mechatronics? According to the prognoses 62,5% thinks there is a labor market demand. It is a big hope for developing mechatronics methodology. It is very important to

develop key competencies of the mechatronics subject, so the next question was about it. Is it a key competence (vocational) for your students? We got 72 'yes' and 8 'no'. These competencies are the values of a job or a profession, which can increase the labor market value of the employee. Additional competences are also very useful and have added values. Is it a key qualification (extra added value) for your students to the basic profession? They are not obligatory parts of the job, but give advantages.

In the next question we wanted to know the general marking of mechatronics. Mark the importance of mechatronics, please. 4.63 (65/5, 11/4, 6/3, 0/2, 0/1; 1-5 range) looks very good, which supports us to continue with the project development. We asked about the opinion of the labor market and they answered the students need mechatronics competencies to graduate from the Leonardo da Vinci project partner schools.

Can you offer mechatronics courses for further education? And can your school add some more knowledge about mechatronics for learners? The answers show it seems a good idea to organize further education courses as well.

The last part of questionnaire surveyed our running Leonardo da Vinci partnership project. How do you think about this Leonardo project (about the development of mechatronics integration into education)? Very useful 5 – I am disappointed 1. (Figure 1)

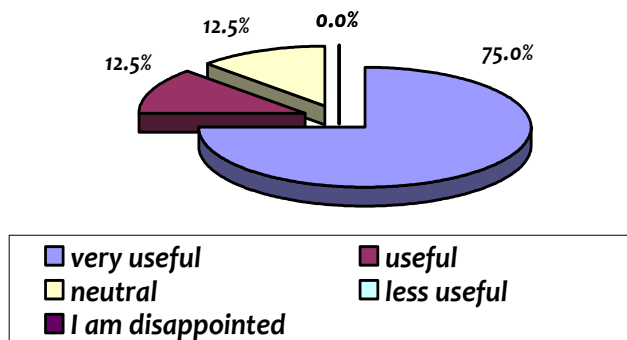


Figure 1. Answerers on the usefulness of the program (about the development of mechatronics integration into education)? Very useful 5 – I am disappointed 1. (Figure 1)

Answerers support our project. They think this form of cooperation is useful or very useful. The most important part of the project is the development of teaching materials and methods.

Having finished the mechatronics project, it is interesting to see that general competencies are the main output of the project. Before starting the project, we thought special skills and competencies would be that. In the end, the opposite seems to be the more important output.

We tried to check the pedagogical added values of the project. 50% of the teachers taking part in it are very satisfied, 37% satisfied and the rest is not; the average score: 4.12. That is the reason why it was important to complete this project.

Last question was: Would you like to continue this partnership in a new project? 87.5% answered 'yes'. We wish to continue our partnership and apply for further subsidies.

CONCLUSIONS

All of us use constructive criticism as a valuable pedagogical tool to help our students in a variety of ways: to broaden their perspectives, to deepen their understanding, to improve the quality of their work, to motivate reflection on their progress, etc. It is imperative to the learning process that our students have opportunities to receive feedback, including that which is negative, and incorporate that feedback into further understanding and/or performance. How we provide that feedback is equally important to assure that our students do, indeed, hear, process and use what we say as they continue to develop. Constructive criticism, performed effectively, is a productive educational activity.

In many disciplines, like in mechatronics, criticism and feedback are delivered privately, e.g., comments on papers, grades on exams. In other disciplines, however, students receive feedback and criticism in public settings. The public nature of feedback, particularly criticism, complicates how effective it is as a form of pedagogy; we don't want defensiveness and embarrassment to get in the way of our students' learning from these reviews. Equally we do not want embarrassment or strictly personal criticism used as pedagogic tools.

The nature of the public review varies as a consequence of a number of factors.

These include (www.cmu.edu/index.shtml):

- when the review is held (e.g., half way through the project vs. end of the project);
- the level of the students being reviewed (e.g., first-years vs. seniors);
- the purpose and objectives of the review (e.g., to get students to reflect on their creative process vs. to challenge students' creative boundaries); and
- who the reviewers are – internal (e.g., the course faculty member and/or students in the class) and/or external (e.g., other faculty from the department, faculty outside the department, practicing professionals).

Based on these factors, the instructor needs to, for each review, develop and refine among reviewers and students a shared understanding of the goals, scope, and evaluation criteria. We hope will have a chance to continue and develop our mechatronics project in the future.

QUESTIONNAIRE ABOUT PEDAGOGICAL ADDED VALUE IN CASE OF MECHATRONICS

Dear Teacher/Trainer Colleague,

Please, fill in this questionnaire in order to help us to develop our Leonardo da Vinci Partnership project. Cross the most suitable answer, please.

- Answerer is from: Germany Hungary Turkey
- | | | | |
|-----|---|-------|----|
| 1. | Do you have in your school mechanical subject(s)? | yes | no |
| 2. | Do you have in your school electrical subject(s)? | yes | no |
| 3. | Do your learners have any pre-knowledge about mechatronics? | yes | no |
| 4. | Do you teach mechatronics integrated in different vocational courses? | yes | no |
| 5. | Do you have mechatronics as a separated subject in your teaching program? | yes | no |
| 6. | If yes, is it | | |
| | a. a theoretical subject | | |
| | b. training in workshop | | |
| | c. both of them? | | |
| 7. | Do you have high quality, modern facilities to teach mechatronics? | yes | no |
| 8. | Do you have partners (companies) that offer mechatronics training (in workshop) for your learners? | yes | no |
| 9. | Is there any labor market demand for mechatronics? | yes | no |
| 10. | Is it a key competence (vocational) for your students? | yes | no |
| 11. | Is it a key qualification (extra added value) for your students to the basic profession? | yes | no |
| 12. | Mark the importance of mechatronics, please.
(not important 1 – very important 5) | | |
| 13. | Is it a mentioned requirement by companies (labor market)? | | |
| | a. always | | |
| | b. often | | |
| | c. rare | | |
| | d. never | | |
| 14. | Can you offer mechatronics courses for further education? | yes | no |
| 15. | Can your school add some more knowledge about mechatronics for learners? | | |
| | a. yes | | |
| | b. partly | | |
| | c. no | | |
| 16. | How do you think about this Leonardo project (about the development of mechatronics integration into education)?
Very useful 5 – I am disappointed 1 | | |
| 17. | Do you think any useful teaching material as the project product? | yes | no |
| 18. | Which type of competencies will be developed? | | |
| | a. (general or special e. g.); | | |
| | b. creativity, problem solving, other | | |
| 19. | Are you satisfied with this project: very satisfied 5 – very unsatisfied 1... .. | | |
| 20. | Would you like to continue this partnership in a new project? | yes | no |

Any other comments:

Thank you for your answers!

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