The Implementation of Different Types of Portfolio in the Assessment of Student's Knowledge and Performance

Ioana Roman[a]*, Roman Raoul[b]

* Corresponding author: Ioana Roman, ioanaromant@yahoo.com

[a]University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania, ioanaromant@yahoo.com
[b]University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania, raoul.roman@gmail.com

Abstract

http://dx.doi.org/10.15405/epsbs.2016.09.102

Portfolio can show us an evidence of students learning during a semester or year for a discipline. It is a complex evaluation tool. It represents an alternative to standardized tests, leading to the emission of a value judgment based on a set of results, reflecting the complexity of the development of the person who prepares it. The comparing study was done between three types of portfolios applied in the evaluation of students from second and third year, students from Department for Teacher Training (DPPD) from USAMV Cluj-Napoca. First type is the portfolio of development, elaborated by groups of students (four students by each group) and used as a portfolio of progress for the discipline Didactics of Chemistry. Second type is an individually portfolio; it is used for students' assessment at the Teaching Practice. Third type is an e-Portfolio use for assessment of students' knowledge for the discipline Computer-aided Instruction. This paper has focused on systematic evaluation of influence which achievement of portfolios can generate in training of future teachers. There was determined a tendency to minimize the role of portfolios in this training, although from the point of view of the learner it is a complex activity. Teachers, who used portfolios like a variant of assessment, generally agreed that it was a holistic qualitative evaluation method, which involves students in educational activities. Majority of students considered that portfolios were an interesting experience; they had an active role which made them to know better their possibilities to study and learn.

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Keywords: Alternative assessment methods; efficiency; flexibility; steps in creating portfolios; students' creativity.

1 Introduction

In Zubizarreta (2004) opinion, the portfolio is a flexible, evidence-based process that combines reflection and documentation. In their book Foster *et al.* (2007) presented all steps necessary to realise a portfolio. This book is a practical guide for students who want to become teachers.

Portfolio is an alternative method of evaluation, through teacher can follows progress of students, in terms of scientifically knowledge, over a period of time - semester or school year. Nezakatgoo (2011) expressed his opinion about portfolios' purpose: "In other words portfolios show a student's work from beginning of the term to the end. They give both teacher and students a chance to evaluate how much the students' writing has progressed." Senger and Kanthan (2012), analysed the learning portfolio, in their vision it is a collection of student work aimed at evidencing learning and professional development.

According to Banta (2003) "portfolios permit the display of authentic evidence of what students know and can do, they have face validity for all concerned; that is, portfolios appear to be credible sources of information about what faculty are teaching and what students are learning".

Fensten (2009) in his research presented information about the portfolio contents: "The portfolio itself is a container of some sort, for example, a folder, crate, file, or virtual space for online portfolios. The selected contents should demonstrate student accomplishments over time. All selections and parts are authentic in that the included pieces provide evidence that the goals and objectives of the curriculum have been met, with added student reflections that review the process and /or products of learning."

Wilkerson and Lang (2003) state that "portfolios being used in a high-stakes context are technically testing devices and therefore need to meet psychometric standards of validity, reliability, fairness, and absence of bias".

In opinion of (Fernsten & Fernsten 2005), reflective pieces require students to articulate and review components of the portfolio and are a part of a comprehensive assessment. Reflections allow students the time and space to analyse their achievement in relation to class standards, evaluate their final products, and determine growth as well as needs.

Li et al. (2015), in their research observed that "correlation is significantly higher when the peer assessment is paper-based rather than computer-assisted". Also they highlight the importance of different types of evaluation: "Given the wide use of peer assessment, especially in higher education, the relative accuracy of peer ratings compared to teacher ratings is a major concern for both educators and researchers. The findings are expected to inform practitioners regarding peer assessment practices that are more likely to exhibit better agreement with teacher assessment."

The objectives of this study are: observation of the influence which achievement of portfolios can generate in training of future teachers; the role that the portfolio has as a complementary assessment method in student's activities; selected credible answers for question: Can portfolio show us an evidence of students learning? This question is important to emphasize the advantages and disadvantages that portfolios have in teaching activity. After that experience the students can understand the strengths and limitations of portfolio. This paper brings a new perspective about the

portfolio concept, and it gave an alternative way to assessment and teaching in agronomic training of future teachers.

2 Materials and methods

The pedagogical literature and researches made by Hartnell-Young and Morris (2007) and Johnson et al. (2006) suggest three type of portfolio: 1. Formative portfolio which is developmental; 2. Summative portfolio which is cumulative and 3. Marketing portfolio, this is focused on career advancement. Another study, made by Fersten (2009) presents four types of portfolios, there are: showcase portfolios, process portfolio, evaluation portfolio and online (e-portfolio).

2.1 Methods and portfolios type

The comparing study was done between three types of portfolios applied in evaluation of 40 students from second and 92 students from third year of study. All of them study at the Pedagogical Department of USAMV Cluj-Napoca.

Data were collected during two years (2014-2015), and analysed using methods like: focus group technique, written impressions, and structured questionnaire with multiple choice items.

In this study we combined common elements of all pair of these portfolios' types, and results three categories of portfolio:

- Development portfolio (40 students, in the second year of study, have elaborated this portfolio in year 2014, in classes of Didactics of speciality).

- Summative – individually portfolio (40 students, in the third year of study, have elaborated this portfolio in year 2015). This kind of portfolio was realized throughout the course of Teaching Practice during one school year.

- E-portfolios (92 students in the third year of study, have made this portfolio, during a semester, in year 2015, in classes of Computer-aided Instruction).

2.2 Selection data

During this stage takes place selection of important materials that will hold portfolio. The materials have been carefully analysed and were added to the portfolio only the relevant documents for students' activity. Selection of materials was made after applying the selection criteria such as: importance of documents, relevant to students' activities, further applicability in practice, content originality and creativity.

3 Results and discussion

To achieve the objectives of this research was necessary to follow next steps in evaluating portfolios' roles. So whatever types of portfolio (portfolio of development or portfolio of individual assessment, or e-portfolio) have been realized the following phases:

3.1 Portfolios' purpose

The role of portfolios were highlighted by the definitions and goals, gave by students, for them. The most interesting definitions of portfolios role, in students' visions, are next ones :"Portfolios facilitates observation of modalities in which students think, how they build their cognitive approach, enabling differentiation and individualization of instruction in further "; "The portfolio is a comprehensive and an interesting assessment tool"; "The portfolio is a tool that allows measurement at multiple levels, from many points of view (evaluated by teachers, employers, colleagues and parents)"; "The portfolio develops the capacity of self-organization and self-control"; " The portfolio develops motivation to learn and form an effective learning style" "The portfolio determines crystallization of an impartial self-image.", " Students can perform complex and new tasks through, portfolio".

When students were asked about portfolio's goals they gave answers like: "For portfolio of development the goal is to reflect student's progress" „ The principal goal is to inform teachers about student's needs."; "These goals were realised by a lot of elements and actions like: prepare projects for different type of lessons, elaborate tests with different types of items, streamline communication at group level and develop students' ability to work in team."; "Portfolio of individual assessment has goals like: reflection of the work of students at Teaching Practice"; „ Portfolios' goal is integration of students into the school educational environment as a future teacher, and support the student in his teaching activities."

3.2 Resource – collection and documentation of students necessaires to realise a portfolio

The collection of data for realizing a portfolio is an important process; it is consisting in a cumulus of: artefacts, papers, essays, lessons projects and examples associated with students work at school and also at home. Smits et al. (2005) specified that "the documentation process does not create a definitive end product but leads to a portfolio that is open to continual reflection and re-examination".

For all three type of portfolios - a significant number of students 29 (from 40) and 78 (from 92) considered that the key resources necessary to design a portfolio must be done by teacher, only 7 students (from 40), respectively 17 students (from 92), believe that they can design portfolio elements without teacher help, and 4 students (from 40), respectively 3 students (from 92) needs sometimes teacher help. We observed that our students depend by their teacher in taking decisions. All elements collected were systematized and logically sequenced according to their importance for future students work.

In their book Fraenkel et al. (2012), advised students about how to prepare their work and gave them a lot of practical examples who can be useful for realizing an individual or team portfolio.
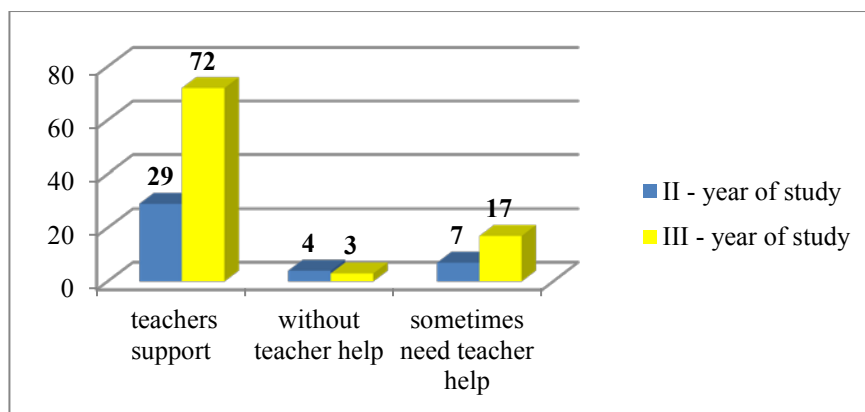
Fig.1. Resources needs

3.3 Students activity – selected relevant data

For portfolio of development were selected themes and useful documents for student activities to discipline Chemistry Teaching like: worksheets, chemistry lessons projects and assessment tests, annual calendar schedules.

Teaching practice portfolio contains school documents, elaborated by students for curricular and extracurricular activities carried out by them in application schools.

For e-portfolio was proposing ten electronic items: student CV, two e-activity sheets, four e-lessons projects, one e-didactic game and two e-tests for assessments.

In opinion of Rodriguez-Farrar (2006) teaching portfolio "include a variety of activities which have had an impact on your teaching such as Teaching Certificate programs, teaching seminars, videotapes of your lectures and classrooms, etc."

3.4 Reflection – key elements relevant for students activities

In achievement of portfolio, reflection is a very important step "a portfolio is not a scrapbook, because the items in the portfolio have some kind of reflection" and students had to "write some kind of reflection about why the pieces were included in their collections".

This step was essential because students have reflected to the role of portfolio items. Each element of portfolio is assigned a role and a function which later will help the student in his future work.

We take for example a portfolio item, namely "annual calendar schedules": its role is to systematize the material thoroughly by time and its functions (specifies competencies) are to organize and to structure the content.

"Important to the act of meaning making is the documentation of a student's learning path and process and the formation of rich, sustained relationships created through reflection upon the documentation" (Smiths, et. al., 2005).

In students' vision (Fig.2), the most important key elements are: summative-individual portfolio (46 students mention it), CV (36 students have chosen it) and worksheets (31 students have chosen them). It was interesting situation because only the students from third year of study believe that CV it is an important element for their portfolio. In the same time for all students from second year, CV is not

relevant. That situation can be explained through that they are pretty close to labour market and their background is important.
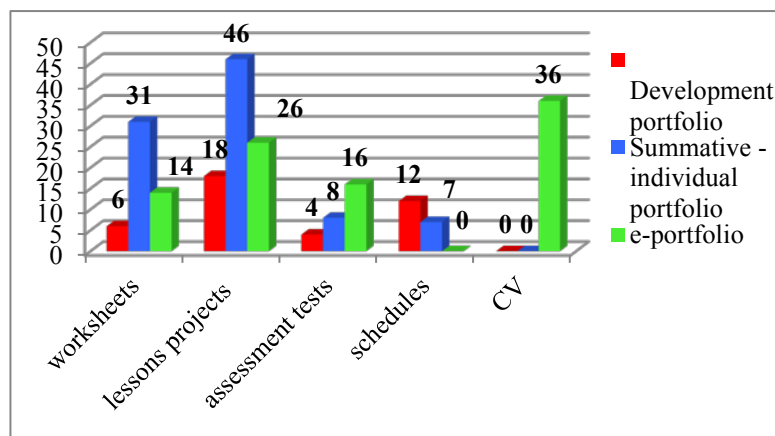

Fig.2. Relevant key elements of portfolio

3.5   Resume – or students' responsibility

This stage includes a presentation realized by each student in presence of their colleagues and their teacher. Presentation made reference to the principal items selected to be parts of the student's portfolio.

Consequently, for the portfolio of development, the student group presented to the Methodist teacher following elements: laboratory workbooks, evaluation tests (along with Scoring and analysis of student achievement), minimum of four teaching projects, tasks and activities specialized teacher or counsellor teacher. It noted the ease with which these elements were presenting. This is explained by the fact that students collaborated on the work done to achieve this type of portfolio. So they worked efficiently because they were not in competition one with another.

For the portfolio of teaching practice, students presented the next elements: evidence of students activities; the rules for organization and functioning of educational practice; requirements and ways of organizing teaching practice, stages in the development of teaching practice, sheets for analysing lessons, prepared and supported students teaching, references used to prepare lessons, projects for educational activity, psycho-pedagogical characterization of students, participation in educational research projects and other materials elaborated by students. It noticed some tension of students during the presentation of the portfolio. This situation is explained because it was individual work of each student and assessment was done both teacher and colleagues.

For e-portfolio this stage was not necessary; students send their activity via e-mail. This manner of sending electronic portfolio had the unintended consequence a delay of response given by the teacher (analysis and response have been taken after 12 to 48 hours) as opposed to other two types of portfolios when the student received the answer immediately.

3.6   Evaluation – or teachers' responsibilities

According to Wilkerson and Lang (2003) in system of portfolio assessment "that allow candidates to choose their own artefacts, minimal competency with regard to standards is difficult to establish".

Criteria of portfolio analyses were depending on the goals of the portfolio, and the types of items collected by students. In our case teachers decided that both portfolios types are necessary to have fixed elements because they wanted to eliminate errors in evaluation. Teacher and students have been discussed (by focus group technique) and debated the portfolios content, after that they formulated conclusions.

Regarding the evaluation of the portfolio of development teachers noted that only a presentation of its constituent elements has not given better results, either because they lacked certain parts of the portfolio that was being watched requirement and the final result was one of tens of variants portfolios various from between groups, and most of them were incomplete. So we resorted to alternative portfolio model that has all the constituents and dotted lines or free areas to be completed by the student.

Generic criteria for the assessment of portfolio of the colloquium graduation teaching practice (established by DPPD of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca) are focused on the inclusion in the portfolio as many and varied components: sheets analysis, observation sheets, activity sheets, teaching projects, educational games, drawing lessons, planning calendar, reports, evaluative tools, teaching research elements, etc. We will also consider the correctness of drafting tools (design, evaluation, and so on) in terms of pedagogical subjects, didactics academic discipline and the specific content. It will be appreciated the timeliness and material connection to news of curricular reform. All these tasks make students responsible and motivate them for teaching career.

The study made by Wilkerson and Lang (2003) reveals that "Since about 90% of schools, colleges, and departments of education are currently using portfolios of one form or another as decision-making tools for standards-based decisions regarding certification or licensure".

3.7 Advantages and disadvantages

This comparative study revealed advantages and disadvantages of applying these types of portfolios in the assessment of student activity.

Banta (2003) mentions that: "Like any other approach to assessment, portfolios have drawbacks as well as strengths. Above all, they require time. It stands to reason that an assessment method which is comprehensive, and permits a look not just at a student's current levels of knowledge and skill but also at the ways in which learning has developed over time, would require extra effort to plan and to evaluate".

The advantages of using individual and collective portfolios include: flexibility, increase motivation of students to engage in evaluation, creativity development and critical thinking. Individual portfolio is a comprehensive assessment tool that includes multiple elements of student's works. The students can develop capacity of objective self-assessment and they can manifest independency and originality in preparing materials which are representing them. Portfolio develops ability to transfer knowledge in real life.

The disadvantages observed when using this evaluation method are: time-consuming, difficulty in evaluation, difficulty to measuring creativity. When students had elaborated their portfolio it was observed differences in opinion between students who made part from the same group.

4   Conclusion

Teachers ascertained that portfolio is an efficient method of assessment because it includes a collection of relevant results obtained by student in specific area of sciences. It also stimulates cognitive development of students and determined them to be more responsible. By practicing such as assessment methods were successful training students in a rigorous activity, and useful. Portfolios offer a wide range of education opportunities and information. Students have developed their intellectual skills, and work habits were formed and life.

The work done in achieving of portfolios motivate students, they managed to enrich the portfolio' content with many new ideas and representative for each theme with their own solutions. Also it was determined to be in constant cooperation with each other.

Students considered that portfolio was an interesting experience; they had an active role which made them to know better their possibilities to study and learn. The portfolio should be simple; materials should be organized harmoniously depending on the content and the specific study of field.

It is recommended that portfolios to be used as an effective measure to assessment of students activities and knowledge. Also it can be considered as a method of learning. There is a need for extended studies which reveal positive change in the process of teaching, learning and evaluation.

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