

## LEARNING THROUGH PORTFOLIO COMPRISING OF WORKSHEETS IN MEASUREMENT AND ASSESSMENT COURSE

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### ABSTRACT

The main aim of the study was to evaluate qualitatively the portfolio process comprising of worksheets conducted as a case in the learning-teaching process of a measurement and assessment course at Anadolu University, Turkey. 42 prospective teachers participated in the study and the data was collected through an open-ended questionnaire. The principal results derived from the views of the participant prospective teachers were that prospective teachers fulfilled the requirements of the portfolio process, realized their learning drawbacks and revised their works, gained the objectives of the course. According to them, the process was useful for learning and retention. Blending the advantages of both worksheets and portfolio process worked almost well according to the prospective teachers.

**Key Words:** Portfolio, worksheet, prospective teacher, assessment.

### INTRODUCTION

Advances in education lead instruction to move more learner-centered approaches and thus contemporary measurement and assessment methods such as performance-based tasks, interviews, constructed grid, poster, project, self, group and peer assessment, portfolio gained popularity. Among the various student-centered measurement and assessment methods, making learner assessment more authentic and to see the learners' growth over time, portfolios were used by educators (Burke, 1997) for many years.

Portfolio is defined as purposefully collecting the students' works which reflect their performances, developments and success in a specific context (Paulson, Paulson and Meyer, 1991). The portfolio which could be also named as personnel development folder, selected product folder, student product folder, is a folder in which the works and the documents related to the works are collected and organized individually and it shows the developments in knowledge and skills during a period of time (Demir, 2012). Portfolios are used with various purposes in educational setting (Belgrad, Burke & Fogary, 2008) such as monitoring the students' development during a time span, increasing the sense of responsibility of the students, helping them in gaining self-assessment ability and self-confidence, helping the learners to increase their thinking and problem solving skills, showing the students' works, conducting formative assessment (Paulson et al., 1991; Kutlu, Doğan & Karakaya, 2010).

According to various purposes, different types of portfolios have been defined in literature. For example, Danielson & Abrutyn, (1997) stated three types of portfolios: Working, display, showcase or best works and assessment portfolios. Correlatively Kan (2007) defines three types of portfolios as documentation, process and show-case. Each type of portfolios has different purposes and processes. In educational settings, to see the development of the learners is very crucial. Working portfolios contain the works in progress and the finished

works of the learners (Danielson & Abrutyn, 1997) and show the learning outcomes related to the subject studied. Thus, working portfolio type might suit well for educational purposes of the kind to follow the learners' development regarding to a specific subject.

Alongside the advantages of portfolio for all of the instructional levels and institutions, using especially portfolios in teacher education programs has a specific importance. Using this kind of portfolios in teacher education programs help the prospective teacher in monitoring their development in learning process and to learn how to conduct such an authentic assessment in their future teaching profession. Indeed, when they realize their intellectual, cognitive or educational development with the help of the portfolio, this will lead a powerful impact on their growth and self-awareness (Dietz, 1996). Moreover, portfolios make a connection between theory and practice and help prospective teachers in developing themselves during their education process (Demir, 2012). With the help of the portfolio, prospective teachers share their works with their peers and instructors and take guidance and suggestions regarding their learning process (Demir, 2012). This latter advantage of the portfolio is also very valuable in means of learner-learner and learner-instructor interactions because the interaction is an important factor that effects the learning outcomes.

As one of the components of portfolios, specifically the working portfolios, worksheet is an important educational material that is used for the teaching of any subjects, providing retention or assessing the students' level of reaching the aims and objectives (Göçer, 2012). Worksheets could be used for summarizing, enhancing or reviewing a subject (Yanpar-Şahin & Yıldırım, 2009). Indeed, with the help of the worksheets, all of the learners could participate in the activities (Sands & Özçelik, 1997) during the learning-teaching process. Worksheets are the instructional materials that explain what learners need to do, help them in constructing the new information in their minds and actively be involved in the learning process and provide an opportunity of conducting practices on theoretical subjects.

Worksheets are often used for providing a learner-centered instruction and dispelling the learners' conceptual misunderstandings (Demircioğlu & Atasoy, 2006) Additionally, they could be used for making theoretical subject more concrete and helping learners apply their knowledge on new and authentic problems. Thus, including worksheet activities into the learning-teaching process of the courses in teacher education programs might be helpful for prospective teacher to fulfill the required competencies regarding the teaching profession. Worksheets might provide more benefits for prospective teachers while they were studying relatively more challenging courses to make them more explicit, concrete and applying theories into practice.

Among the various such courses related to teaching profession in teacher education programs, measurement and assessment course is one of the compulsory courses for the prospective teachers of most of the education faculties in Turkey. Though the importance of the measurement and assessment course in teacher education curricula, prospective teachers might not fulfill the required competencies regarding the measurement and assessment in education as revealed in the studies of Gök and Erdoğan (2009) and Gencil and Özbaşı (2013). Indeed, the subjects related to basic statistical calculations of the course's content might be sometimes challenging for the prospective teachers of the fields like social sciences and fine arts. Thus, the attitudes towards the measurement and assessment course might be effected negatively. Yaşar's (2014) study conducted on prospective teachers regarding their attitudes towards the course revealed also very low levels of attitudes toward the course. To help the prospective teachers learn better, increase their attitudes toward the course and competencies regarding the measurement and assessment and improve the effectiveness of the learning-teaching process of the course, "portfolio process comprising of worksheets (P-WS)" was implemented in the current study. The aim of the study was to report and evaluate the P-WS process according to the views of the prospective teachers.

## METHODS

The method of the current study was a case study in which the P-WS process was evaluated according to the views of the prospective teachers.

### Participants

42 third-year prospective teachers (21 male and 21 female) of social studies education at Anadolu University were attended the course regularly and fulfilled the course requirements.

### The learning-teaching process of the course and the P-WS process

The learning-teaching process of the measurement and assessment course was conducted in the classroom setting. There were 12 weeks class (three hours for each) apart from exam weeks and 9 worksheets assigned to the learners. The focus of the assigned worksheets were the specific aspects of the content of the course. The prospective teachers should have been studied the worksheets during course hours in pairs or small groups and kept them in their portfolios. Though nine worksheets required team-works, each learner should have collected his/her own portfolio. Thus, after studying in teams, the learners copied their worksheets for their own portfolios. An additional work to the worksheets for portfolios was to write a reflection letter on a cultural, sportive or scientific activity and include the reflection with an evidence (a ticket, participation letter, etc.) into the portfolio. The aim of the last component of the portfolio which seems nonsense among the assigned worksheets was to motivate prospective teachers to take part in such activities.

### The assessment process of the P-WS

The measurement and assessment course included a mid-term exam, a final exam and a homework which was assigned as P-WS. Instructor collected the portfolios two times in the term to write feedback on the worksheets and gave a chance to learners for improving their knowledge and skills regarding the course. Thus, learners received two scores from the two assessments for their portfolios. The first assessment of the P-WS was named as mid-assessment and conducted before the mid-term exam. The second assessment of the P-WS was the comprehensive one and portfolios with 10 components were assessed, feedbacks were written on the remaining 6 worksheets. Additionally, first four worksheets which were assessed before were also reviewed for additional works of the learners according to the first feedbacks on them. The assessment criteria of the portfolios were shared with the participants at the beginning of the course term.

### Data collection and analysis

At the end of the term, an open-ended questionnaire developed by the researchers was applied and 41 of the participants answered the questions voluntarily. For the analysis process of the questionnaires, descriptive thematic analysis was conducted. During the analysis process, firstly pre-defined themes and sub-themes were decided in the light of the questions on the questionnaire and the first overall readings of the answers of the prospective teachers to the questions. Then, two researchers were coded the whole data set into the pre-defined themes independently. Afterwards, the researchers came together to discuss and compare their own results of thematic analysis. For the disagreements on the results, the two researchers returned to the data and discussed to come to a consensus. Finally, inter-coder reliability ratio between the two researchers was calculated according to the Miles and Huberman (1994) and 96% was found. Themes derived from the views of the participants were exemplified through the direct quotations by coding as PS (Prospective Teacher) with a number (eg. PS-17). If a view of a participant included more than one theme, it was coded into related themes.

## RESULTS

The findings derived from the thematic analysis on the views of the prospective teachers were presented under the five main themes which were set according to the questions on the questionnaires.

### The Content of the Portfolios

All of the participant prospective teachers (n=41) indicated their views regarding the content of their own portfolio. They specified the content of the portfolio by specifying worksheets one by one or as a whole and their reflection on an activity. Thus it was possible to deduce that the prospective teachers met the requirements for the portfolios. Apart from the required components of the portfolios, on Table 2, the other components indicated by the prospective teachers were given.

Table 2: Other views of the prospective teachers regarding the content of the portfolios

<b>Other components of the portfolios</b>	<b>n</b>	<b>%</b>
Lecture Notes	9	21.95
Course Schedule	6	14.63
Final Assessment Criteria	4	9.76
Cover Page	3	7.32

According to the views of the prospective teachers, nine prospective teachers (21.95 %) included lecture notes composed of handwrite of the learners during the lectures or the instructor's notes given to them. Regarding the lecture notes, a student indicated his views as given below:

[PT-5 "..., the developmental characteristics of the children, item analysis work sheet, the lecture notes about measuring error types, measuring error worksheet, ..... the lecture notes taken during the lecture hours, .."]

Additionally, course schedule (14.63%), final assessment criteria (9.76%), and cover page (7.32%) found place on portfolios. In addition to the components given on Table 2, explanations about the process of the course, the developmental characteristics of the children, forewords of the prospective teacher about his/her portfolio and individual works done on the worksheets after the class hours were each indicated by only one prospective teacher. In the light of the views of the students, it was seen that prospective teachers broadened their portfolios by including other components related to the course in addition to the required ones.

#### The P-WS process

The prospective teachers were asked for indicating their views regarding the P-WS process. The themes derived from the questionnaires related to this issue were presented on Table 3.

Table 3: Views of the prospective teachers regarding the P-WS process

<b>The themes related to P-WS process</b>	<b>n</b>	<b>%</b>
Ensuring retention	25	60.98
Being useful	16	39.02
Facilitating learning	15	36.59
Reviewing the learned content	14	34.15
Learning through practicing	9	21.95
Ensuring enjoyable and pleasant learning process	9	21.95
Being a compliance between the portfolio and the content of the course	7	17.07
Enabling the assessment of the learning process	6	14.63
Being helpful for while studying for the exams	6	14.63
Being a motivating agent to the course	4	9.76

As showed on Table 3, more than half of the participants (60.98%) indicated the effect of P-WS process on their learning and highlighted the long term retention such as the below words of one of the prospective teachers:

[PT-1 "Because the same worksheets (in the portfolios) were practiced and learned during the course hours, ensured learnings to be long-lasting. By this way, the subject were learned exactly."]

16 prospective teachers (39.02%) indicated the usefulness of the P-WS process. For example, one of them highlighted the convenience of the P-WS process in means of usefulness as the following.

[PT-9 "It was useful for us. Being parallel to the course studies provided convenience to us in means of learning the course topics."]

The P-WS process was found facilitative for learning (36.59) in means of such as not-taking, following the content, gaining a summary of the course, preparing for the exams by the participants. The prospective

teachers were also found the P-WS process positive according to themes given on Table 3 as reviewing the learned content (34.15%), learning through practicing (21.95%), ensuring enjoyable and pleasant learning process (21.95%), being a compliance between the portfolio and the content of the course (17.07%), enabling the assessment of the learning process (14.63%), being helpful for while studying for the exams (14.63), being a motivating agent to the course (9.76). According to the derived themes from the views of the prospective teachers, they had positive views regarding the P-WS process and benefited from the process.

#### The mid-assessment of the portfolios

The themes derived from the views of the participants related to this mid-assessment activity of the instructor were given on Table 4.

Table 4: Views of the prospective teachers regarding the mid-assessment of the portfolios

<b>The themes related to mid-assessment of the portfolios</b>	<b>n</b>	<b>%</b>
Seeing the learning drawbacks with the help of received feedbacks	32	78.05
Providing opportunity for corrections on worksheets	22	53.66
Being beneficial	19	46.34
Effecting the quality of the studies positively	5	12.20
Receiving the expected grade	5	12.20
Feeling happy for receiving feedback	5	12.20
Having simplification for understanding with the help of the feedbacks	4	9.76
Knowing the follow-up of their studies by the instructor	3	7.32
Being motivating	3	7.32
Helping for being neat while preparing the portfolio	2	4.88

According to Table 4, most of the participants (78.05%) highlighted the advantage of seeing their learning drawbacks with the help of mid-assessment. For example, one of the prospective teachers indicated the below words about this issue:

[PT- 32 "With the help of the feedbacks given to us on mid-assessment, we saw our learning drawbacks and understand how to correct them. This situation help us to fulfill the missing subjects during the lecture and practicing. By this way we had a chance to proceed more substantial."]

While gaining feedback is an important issue, making corrections according to the taken feedback is also crucial. Nearly half of the participants indicated the opportunity for making corrections on worksheets (53.66) according to the feedbacks written on their worksheets. Two participants indicated the following words related to this theme:

[PT- 23 "... We could implement what we had learned during the lectures and we could again correct them..."]

[PT- 33 "It provides feedback. We could see our lacking and correct them."]

Apart from the feedback and corrections, nearly half of the students (46.34%) specified "being beneficial" for the mid-assessments of their portfolios. The participants also indicated different views regarding the mid-assessment. Seven different themes with 2 to 5 frequency were derived from the participants' views: Effecting the quality of the studies positively, receiving the expected grade, feeling happy for receiving feedback, having simplification for understanding with the help of the feedbacks, knowing the follow-up of their studies by the teaching staff, being motivating, helping for being neat while preparing the portfolio.

In the light of the derived themes from the views of the prospective teachers, it could be indicated that the mid-assessment of the portfolios produced very positive results especially in means of gaining feedback and conducting revision works. It is possible to inform that the participants benefit from the mid-assessment process of their portfolios.

### The learnings of the prospective teachers during the P-WS process

The ultimate aim of the P-WS process was to help prospective teachers in learning more and effectively. The themes derived from their views regarding their learning during the P-WS process were given on Table 5.

Table 5: Learnings of the prospective teachers during the P-WS process

<b>The themes related to learnings</b>	<b>n</b>	<b>%</b>
Learning the course content	19	46.34
Learning the portfolio collection process	9	21.95
Learning to study regularly and neatly	5	12.20
Learning the possibility of monitoring the development level	4	9.76
Learning from peers	2	4.88

According to the results of the data analysis given on Table 5, nearly half of the prospective teachers (46.34 %) answered this question by indicating the content of the course. Two of them expressed their views as the followings:

[PT- 3 "I learned all of the content of the course. ..."]

[PT- 6 "I learned the basic concept related to measurement and assessment, what are the traditional and alternative measuring instruments, measured features, what can be done for reliable and valid measuring instruments, basic statistical calculations and how to use them for measuring and assessment. "]

Other nine participants (21.95 %) highlighted the portfolio collection process while indicating their learnings as one of them stated below:

[PT- 22 "I comprehended the content of the Measurement and Assessment Course more shortly and genuinely. I learned what should be done for revealing a nice product. Most importantly, before I become a teacher, I did such a homework that I will expect from my students and I learned by living personally the acquisitions and learning process of it."]

On the other hand, five prospective teachers (12.20 %) focused on their studying habits regarding their learnings. One of them stated the below words about this issue:

[PT- 35 "I learned being neat, tidy, planned. I learned studying regularly in a weekly manner. ..."]

According to the findings regarding the learnings of the participants, it was seen that in general means, P-WS process helped prospective teachers in learning mainly the content of the course and portfolio collection process. However, other learnings such as learning to study regularly and neatly indicated by few participants were also valuable.

### Problems of the P-WS process

The problems which prospective teacher came across during the P-WS process were also investigated. According to the views of the participant prospective teachers, nearly half of them (53.66%) did not come across any problems during the process. They expressed this situation such as the below examples:

[PT- 7 "I did not have a problem during the portfolio collection process. The works were quite clear. Because our instructor helped us during the course, I did not have a problem. "]

[PT- 18 "I did not have any problems. Towards the knowledge that I learned during the course, I completed the works easily."]

The remaining participants indicated few problems given on Table 6.

Table 6: Problems of the P-WS process

<b>The themes related to problems</b>	<b>n</b>	<b>%</b>
Coming across the difficulty of doing the worksheets of the missed lectures	11	26.83
Coming across the difficulty of doing statistical calculations	4	9.76
Coming across the difficulty of writing aims and objectives	2	4.88
Losing the worksheets	2	4.88

The most indicated problem was coming across the difficulty of doing the worksheets of the missed lectures as showed on Table 6. Because the worksheets were studied during the lecture hours with the supervision of the instructor, the participants found worksheets difficult when they had missed the related lectures. 11 participants (26.83 %) indicated this problem and one of them expressed the situation as the following:

[PT- 26 "I had difficulty while filling and understanding the worksheets of the weeks that I did not attended the course."]

In addition to the above problems, four participants (9.76 %) focused on doing statistical calculations as a problem. They indicated this problem as the below two example:

[PT- 21 "Because we're a social weighted class, after a very long time, we had a misperception of mathematical calculation. But with the help of the practices conducted in the classroom, this misperception ratio was decreased to a minimum level. "]

[PT- 38 "I had a little bit problem on statistical issues nevertheless afterwards I seen that they were not too difficult. "]

According to the above examples, especially at the beginning of the process, the prospective teachers studying on social sciences had difficulty of conducting statistical calculations. However, this problem was not the case at the end of the P-WS process since they learned how to handle statistical calculations.

In addition to these problems, few participants indicated two more problems which were themed as coming across the difficulty of writing aims and objectives and losing the worksheets. Writing suitable aims and objectives requires hard work so that two participants complained about this issue. Other two participants focused on the lost worksheets that they studied during the class hours. Fortunately, all of the worksheet were reachable from the photocopy center of the faculty and the participants should have filled in the lost worksheets again. According to the views of the prospective teachers regarding the problems of the P-WS process, it is possible to infer that, in general mean, the P-WS proceed almost well apart from the few problems indicated above.

## DISCUSSION

Benefits of the portfolio collection during the learning-teaching process are widely known and used in educational settings. Nevertheless, content of the portfolios changes according to the aims and objectives of the course program. In the current study, the required components of the prospective teachers' portfolios were the worksheets designed according to the measurement and assessment course program.

In the present study, the components of the prospective teachers' portfolios were questioned and it was seen that the portfolios included more components than the required ones. This finding could be taken as a signal of the benefits of providing flexibility regarding the components of the portfolio to the learners. With the help of this kind of flexibility, the learners could be able to include whatsoever they like into their portfolios to promote their learning regarding the topic studied.

The flexibility of including relevant components into the portfolio could serve learners to improve their understanding regarding the issue studied and follow their development process. The difference of the P-WS

process was the worksheets studied during the lecture hours by the prospective teachers in peers or small groups with the supervision of the instructor. The findings regarding the P-WS process revealed that the participant prospective teachers enjoyed the process and benefited. The positive views of the participants could not be only dedicated to portfolio collection, but also to worksheets studies during the course. Other studies related to worksheet usage for various educational purposes generally revealed positive results (Johnson, et al., 1997; Pee, et al., 2002; Roth, et al., 2003; Yağdıran, 2005; Atasoy & Akdeniz, 2006; Çınk, 2007; Özay-Köse, 2010; Yeşilyurt & Gül, 2011; Göçer, 2012; Turan, 2012; Kutluca & Baki, 2013). According to the literature and the results of this study, worksheets facilitate learning, provide enjoyable learning experiences, increase motivation and academic achievement, and increase retention.

In addition to the benefits of using worksheets during the learning-teaching processes of the courses for more meaningful learning, as in the P-WS process, on its own, portfolio collection reveals very positive results when it is used for educational purposes. The related literature regarding the portfolio usage in educational setting highlights the positive effects of portfolios on the learners' attitudes, motivation, self-confidence, responsibility, learning, success, researching abilities, self-assessment ability and creative thinking skills (Smith & Tillema, 2001; Uzun, 2006; Bahçeci & Kuru, 2008; Bedir, Polat & Sakacı, 2009; Ayva, 2010; Bal, 2012; Aydın & Kocalar, 2014).

Portfolio process itself requires active student engagement. P-WS process of the current study encouraged participants to be active during the learning-teaching process of the course. During the course hours, after the lecture activity of the instructor, prospective teachers studied on the worksheets in peers or small groups. These activities provided opportunity for student-student interactions. Meanwhile, the instructor supervised the working groups while they were studying on worksheets and provide them immediate feedbacks. Thus, more learner-instructor interaction was assured in addition to learner-content interaction which was revealed during their studies on worksheets. These three types of interaction is one of the key factors for enhancing more meaningful learning (Garrison & Anderson, 2003). According to the findings of the study, with the help of active engagement of participants to the learning-teaching process and more interaction because of the P-WS, a series of learning outcomes were revealed.

One of the other supportive factors for more meaningful learning is formative assessment. With the help of formative assessment, following the learners' works and providing feedback are possible. Portfolios might be used for either formative or summative education purposes (Hult, 1996) or both. Indeed, in respect to the traditional measuring and assessment methods, portfolio assessment is found to be more effective (Deveci, Ersoy & Ersoy, 2006; Bahçeci & Kuru, 2008; Acar & Anıl, 2009). In the current study, portfolios were collected and assessed two times in a term; before the mid-term and final exams to help learners in realizing their drawbacks and revise their works. Actually, both assessments worked as formative since the participants were provided with feedbacks and a chance for revision studies on their worksheets. However, in the present study, views of the prospective teachers specifically on the first assessment which was called as mid-assessment were asked because instructors generally collect and assess the portfolios at the end of the course. The views of the participants supported the virtue of mid-assessment of the portfolios. In general means, participant prospective teachers found the mid-assessment very useful. Similar results regarding the advantages of formative assessment facility of the portfolios were revealed in other studies (eg. Deveci, Ersoy & Ersoy, 2006; Bahçeci & Kuru, 2008; Ayva, 2010).

On the other hand, during the assessment studies of the portfolios, grading or not the portfolio studies is a discussed issue (Danielson & Abrutyn, 1997). In the current study, the portfolios of the participants were graded, and this grades were not only dedicated to the whole portfolios, but also to the each worksheet inside them. The prospective teachers did not mentioned any negative aspect of this grading system of the P-WS process. On the contrary, they highlighted their satisfaction about gaining their expected grades and the assessment criteria. However, on another study, prospective teachers indicated their negative views related to the assessment and grading of the worksheets (Atik-Kara & Kürüm-Yapıcıoğlu, 2013). In this context, it is possible to infer that grading the works of the learners on their portfolios might produce positive results as the



case of this study only if the formative assessments were conducted and the criteria were accepted by the learners.

According to the results of the present study, the P-WS process was almost approved by the participant prospective teachers though few problems were emerged. The most cited problem was the difficulty of doing the worksheets of the missed course hours. During the course hours of the current study, the instructor explained the worksheets and guided to the prospective teacher while they were studying on them and provided feedback. Therefore, it was more difficult to understand and fill-in the worksheets when the participants did not attend to the related course hours. Another reported problem was the difficulty of conducting the statistical calculations. Because of the social backgrounds of the participant prospective teachers, their difficulty with statistics is understandable. In another study which investigated the attitudes of the prospective teachers towards the measurement and assessment course revealed that the attitudes of the prospective teachers studying the numerical fields such as science education or mathematic education were higher than the learners of the social weighted fields (Süral, 2014). Another study (Gencil & Özbaşı, 2013) which investigated the perceived levels of competence towards the measurement and assessment revealed the significance difference according to the departments of the prospective teachers. However, in the current study, the views of the participants who indicated this problem showed that fortunately the difficulty level that they lived was decreased during the term. This finding could be also taken as one of the benefits of P-WS.

#### CONCLUSION AND RECOMMENDATIONS

It is possible to indicate that according to the participant prospective teachers of the current study, they completed the P-WS process with mainly positive views and gained the objectives of the measurement and assessment course. They also broadened their learning outcomes with the help of the P-WS process of the study. As Danielson and Abrutyn (1997, p.9) indicated, "the magic of portfolios lies not in the portfolios themselves, but in the process used in creating them...". In this sense, blending the advantages of both worksheets and portfolio collection into the P-WS process worked almost well according to the prospective teachers. In any educational settings convenient for applying portfolio and worksheet assignments, P-WS process could be conducted to ensure more meaningful learning and long-term retention. For the future studies the followings were recommended:

- In addition to the instructor's assessment results, prospective teachers could grade their and peers' portfolios.
- E-portfolios might be more convenient. Thus P-WS process might be conducted through blended learning.
- A detail tutorial related to the worksheets might be prepared for the prospective teachers who could not attend the class.
- An adaptive educational hypermedia system could be developed to address different learning styles of the prospective teacher. In such system, the media and worksheets might be adapted to learners according to their learning preferences.

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