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Design applications of apprenticeship productive teaching monitoring systems

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Abstract. This paper aims to design an application that can help the school and the company in monitoring the implementation of apprentices' productive teachers using internet applications. The monitoring system implemented is still manual and through direct monitoring that takes up considerable time and effort. Implementation of productive teachers' apprenticeship is currently less effective in terms of implementation time and other busyness faced by productive teachers. This monitoring application design is an innovation in the development of productive teacher apprentices model that can streamline and streamline apprenticeship monitoring. The working system of this application can be used anywhere because the supervisor can monitor from the internet the workplace each containing the presences, daily activity reports, activity photos, daily evaluation results by the company, and daily targets.

1. Introduction

The productive apprenticeship of teachers in the industry is one of the means by which teachers improve the mastery of vocational theory and practice. This will have a direct impact on improving teachers' ability to implement practical and theoretical learning activities in schools. Apprenticeships formally combine and alternate company-based training (periods of practical work experience at a workplace) with school-based education (periods of theoretical/ practical education followed in a school or training center), and lead to nationally recognized qualification upon successful completion [1]. This is in line with that opinion apprenticeship training is a form of vocational education characteristic of German-speaking countries. The most salient feature of this form of vocational education is the combination of school-based instruction with work-based learning [2]. Productive teacher apprenticeship activities are conducted in companies that have cooperated with schools and government so as to create an apprenticeship learning system that is conducive to the needs of teachers. During the internship activities, the teacher focuses on the activities in the industry and releases his main duty of teaching at school at the scheduled time.

Like other apprentices, mentors coming from schools by appointed officials and industry advisers are required to monitor all participants' internship activities. Monitoring activities are presenting checks and ratings, daily activity reports, activity photos, daily evaluation results by the company, and daily targets. Due to the large amount of monitoring material that participants need to present to the

counselors and the limited time and opportunity, this becomes a separate issue in the internship. Productive teacher apprenticeship activities should be done effectively and efficiently due to time and energy constraints. A sound apprenticeship process is not just a matter of "good chemistry" between supervisor and student but a matter of providing access to the real practice of conducting research, "inviting in," opening up the field and thereby providing direction [3].

This paper contains an application design that can help the school and the company is monitoring the apprenticeship of productive teachers by using internet applications. The web app referred to applications that are accessed through a web browser on a network and developed using a programming language (such as: HTML, JavaScript, PHP). To run a website application required a web browser that is installed on the device, both computers and smartphones. Web applications developed at this time are multiplatform or can run on various devices / devices with different operating systems [4]. The monitoring system implemented is still manual and through direct monitoring that takes up considerable time and effort. Implementation of productive teachers' apprenticeship is currently less effective in terms of implementation time and other busyness faced by productive teachers. This monitoring application design is an innovation in the development of productive teacher apprentices model that can streamline and streamline apprenticeship monitoring. The working system of this application can be used anywhere because the supervisor can monitor the internet (website).

2. Research methods

Research on monitoring applications is carried out through initial manufacturing procedures until the output results with the waterfall method [5]. The stages of the method are:

2.1. Library studies

Look for previous research references in both published and published papers once presented. In addition, the reference book about the programming language to be a reference.

2.2. Needs analysis

Analyzing computer needs at schools and companies for teacher apprenticeship monitoring. The analysis starts with the flow of apprenticeship taking, the observation of apprenticeship mechanisms and the collection of data needed for the apprenticeship of teachers.

2.3. System design

At this stage the temporary design of the apprentice's system, in the form of application display with the system menus, icons and so forth. Here is a block diagram of applying productive teacher apprenticeship monitoring.

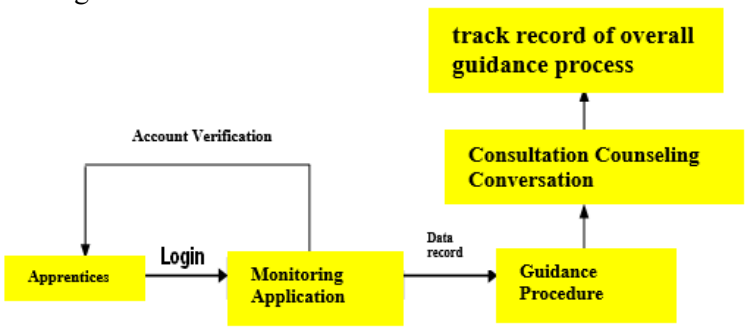

Figure 1. Block diagram of apprenticeship monitoring system.

In Figure 1, it can be seen that participants who will be apprentices must first register into the monitoring application. After verification of the account has been made, then the participants can perform the stages of guidance procedures with supervisory officials according to the procedures of

the school and the company. With the monitoring application obtained all track records of the overall guidance including when the date of the participants to make an apprenticeship report.

Furthermore, the design of monitoring applications can be seen in Figure 2, which is a context diagram of apprenticeship monitoring system.

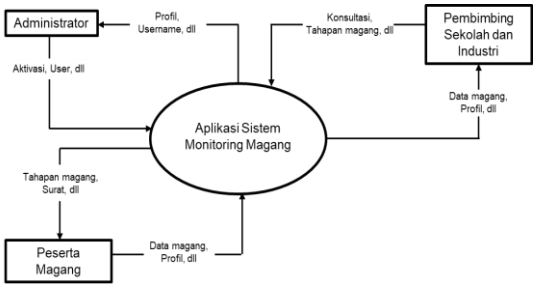

Figure 2. Application context diagram apprenticeship monitoring system.

In Figure 2 there are three application users, consisting of administrators who have full access to the application, such as creating a new account, specifying an apprenticeship lecturer or activating participant accounts and school and industry tutors accounts. In addition, admin can also see the track record of all participants who guidance with his supervisor. Users who have access to a mentor can fill in the supervisor's profile, then view the list of counselees and conduct the apprenticeship process with the participants. Each guidance process performed will be recorded by the system as a track record of counseling between mentors with each participant guidance.

2.4. Programming

At this stage, the database structure, tables needed, table relation, and programming for data processing will be used in apprenticeship monitoring application. The main design view in the monitoring application is divided into three parts, among others, as follows:

- The School Guide's main page, which also serves as the Admin
- The main page of Industrial Advisor
- Attendant's main page.

2.5. System integration and testing

System integration is done by connecting databases and programs that have been made. In addition, system integration is done on each device whether it can be integrated properly. What is done in the testing phase are as follows:

- Check the connection between device and server.
- Seeing what the system display can perform according to the existing design.
- Check whether the system validation is in accordance with the operational standard of the procedure.
- Checking for bug (error) program, whether there are errors both in terms of logic and syntax.

2.6. Tools and materials

2.6.1. Tools

- Hardware. The hardware required in the monitoring application is one server and on personal computer to create the program.
- Text Editor. The Text Editor used during the apprenticeship is Sublime Text and sometimes uses Notepad ++ Text Editor.
- Web Browser. Web Browser used is Google Chrome, because it supports HTML5, making it easier in the work of the Application.

- Bootstrap. Making the Application becomes Bootstrap. Bootstrap is a front-end framework that improves the display for mobile devices (Mobile, smartphones etc.) to speed up and simplify website development [6]. Bootstrap provides HTML, CSS and JavaScript ready-made and easy to develop.

2.6.2. Materials. This application is facilitated by the data obtained from the school in the form of internship format. The data obtained are:

- Format assignment letter.
- Apprentice application letter format.
- Format process of school correspondence.
- Apprentice report format.
- Appendix apprenticeship steps.

3. Program design

Based on the design results that have been made, access rights consist of three users, namely school counselors who doubles as administrators, industry counselors and apprentices. The view of the admin page can be seen in Figure 3.

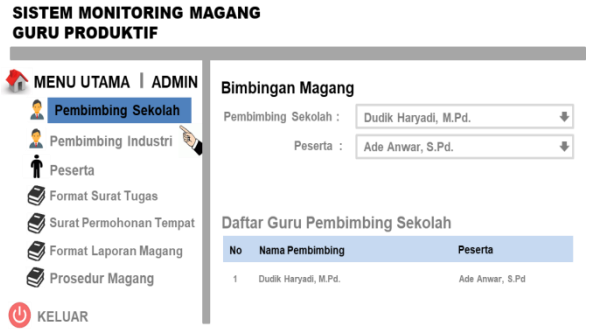

Figure 3. Admin page view.

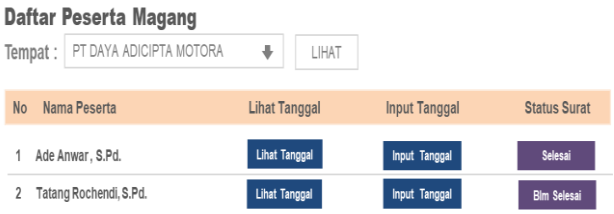

Figure 4. List view of participant who has uploaded the file

Participant and supervisor accounts are created by the admin, this is to avoid creating multiple accounts by participants. Then after the account is created, both the participants and the supervisor must complete their own profile and the apprenticeship registration process by the participants. In addition, the admin duty is to check the validation of letters that have been uploaded by the participant who becomes the requirement of the apprenticeship activity as in figure 4.

After the participants upload the files, the admin will input the date of receipt of the files and check the validation of whether it is in accordance with the conditions specified, and if it has been validated then the participants can proceed to the next process for apprenticeship guidance. In the application process stages that have been passed by participants as in figure 5.

Figure 5. Appearance stage of the apprenticeship process.

In figure 5 above, it can be seen that the participants are in the third stage, namely the maintenance of a letter file. At stage 4, the participants begin to do internships in the designated places, and the participants can conduct an online mentoring process with their mentors. After all the guidance and apprenticeship process is complete, the stages of the guidance process in the monitoring application as in figure 6.

Figure 6. Display the stage of the mentoring process of participants who have completed.

Based on Figure 6 that can be seen above, each stage of the process of guidance is translated in the form of a marker icon, the stages marked with cross (X) indicate that the process has not been completed, while if the checklist (V), signifies the process of guidance in that stage has been completed. The further explanation of the stages of the process of guidance is as follows:

- Stage 1: Upload apprenticeship.
- Stage 2: School applying for an apprentice license to the company.
- Stage 3: School assigns letter of assignment to participants.
- Stage 4: The company returns the mail.
- Stage 5: Participant internship.
- Stage 6: Preparation of apprenticeship report.
- Stage 7: Implement an apprenticeship seminar.
- Stage 8: Improvement process of apprenticeship report.

Participants who have been through the process of guidance from start to finish just waiting for the value of an apprenticeship will be provided by the industry supervisor and school counselors who are officials who are given the task of guiding and becoming an admin.

4. Experiment dan results

In this section, we will evaluate the performance of the app we propose. A study to apprentices has been conducted to find out how users feel when using this app to observe the effectiveness of the application when compared to conventional apprenticeship monitoring systems. We have invited 10 users and divide it into two groups. They are teacher productive techniques and motorcycle business SMKN 4 Sukabumi. Participants are required to have much experience in using personal computers. Each group is told to practice apprentice monitoring system applications and other groups using conventional monitoring or guidance systems. To make the results more fair and comparable, we provide guidance and steps for both groups that are sufficient for them to observe and operate the computer. In the experiment, we assessed the effectiveness of the apprenticeship monitoring system.

After that, they were asked to fill out the post-experiment questionnaire. They were told to rate statements, i.e. about their learning experiences and their use, on a 5-point scale. The more they agree with the statement, the higher they rate it. The statements are listed in Table 1.

Table 1. Question statement.

No	Quistionaire statement
1	Application of apprenticeship monitoring system is easy to operate
2	This application can save time and cost.
3	Communication with mentors becomes easier.
4	Apprenticeship administration becomes easier and complete.
5	Easy to find learning materials and references
6	Apprentice reporting is easier
7	The appraisal system of the counselor is more transparent

4.1. Study results of participants

The results of the study on the participants are shown in Figure 7. Participants assess the application of apprenticeship monitoring app very effectively and efficiently, saving effort and cost, easy to use, easier and complete administration, easier reporting, and assessment from more objective supervisor. This is because the participants are accustomed to using computer applications in the implementation of daily tasks as a teacher.

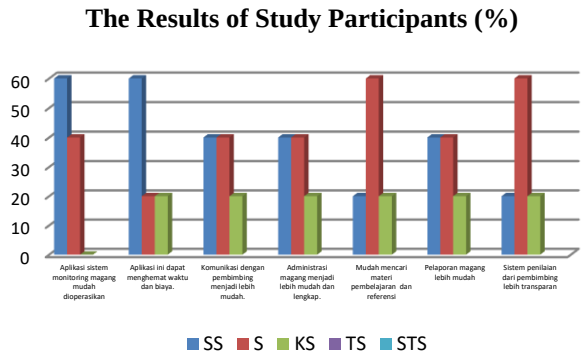

Figure 7. The results of the study participants apprenticeship monitoring system.

Question 1, participants answer as much as 60% strongly agree and 40% agree that applying monitoring apprenticeship system is easy to operate.
Question 2, participants answer as much as 60% strongly agree and 20% agree this application can save time and cost, but there are 20% less agree.
Question 3, 80% of participants answered strongly agree and agree communication with counselors becomes easier, but there are 20% less agree.
Question 4, 80% of participants' answers strongly agree and agree the apprenticeship administration becomes easier and complete, but there are 20% less agree.
Question 5, the answer of participants as much as 20% strongly agree and 60% agree easy to find learning materials and reference, but there are 20% less agree.
Question 6, 80% of participants' answers strongly agree and agree that apprenticeship reporting is easier, but there are 20% less agree.
Question 7, the answer of participants as much as 20% strongly agree and 60% agree the assessment system of the supervisor is more transparent, but there are 20% less agree.

4.2. Discussion

The research that we have carried out in accordance with established procedures can create efficient monitoring system of productive teacher apprentices, so that the apprenticeship is maximal. This is also to overcome the limitations of time and opportunity of teachers as ASN. Especially the duration of apprenticeship is very little, i.e. 14 working days. Apprenticeship monitoring system through internet application on computer used by participant, supervisor and admin very support success apprenticeship activity.

The expertise evident in teacher education departments that provide teaching or assessing qualifications for unqualified teachers and those that need to gain further accreditation of their teaching or assessing skills is not used widely enough across colleges in developing all teachers' skills, supporting high-quality staff development and in sharing of good practice. Often, these departments work separately from managers and teachers who deliver cross-college staff development and this disconnect limits the potential for maximum gain from the good provision [7].

The ability of productive teachers should always be improved, one of them with the implementation of internships in companies or industries. Therefore, the effective apprenticeship is one of the means of improving the ability of teachers, so that the application of apprenticeship monitoring system needs to be realized immediately.

Workplace induction and ongoing support of the apprentice or trainee is normally the job of the workplace supervisor. The supervisor may also be the employer of the apprentice or trainee, especially in a smaller organisation. As the workplace supervisor you are responsible for on-the-job training for your apprentice or trainee. The apprentice or trainee may have regarding their You are responsible for answering any questions training or other aspects of their work. It is your responsibility to inform the apprentice or trainee of workplace expectations, safety procedures, codes of conduct, lunch breaks, WH&S information, etc. Supervisors also ensure the apprentice or trainee is not harassed or bullied in the workplace [8].

5. Conclusions and prospects

5.1. Conclusions

Based on the discussion can be concluded that:

- Monitoring application in the form of website can facilitate the controlling process of apprentice productive teacher so that become more efficient and effective.
- There is a digital apprenticeship data archiving.
- The apprenticeship process becomes more flexible, because the participants do not have to directly face to face with the supervisor.

5.2. Prospects

Prospects for the development of this application in the future that is:

- Apprenticeship monitoring applications can be developed through integration with other systems or applications, such as the Penilaian Kinerja Guru (PKG) application at the school level.
- Monitoring application is one tool that can assist in the process of accreditation of the school because it makes all the guidance activities become more organized and structured.

Acknowledgments

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