

The Efficacy and Usefulness of Online Web Application Based Logbook for Ophthalmology Residents

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Background: Clinical logbooks are an important aspect of ophthalmology training. To overcome the inherent limitations of accessibility, adherence, lack of data validation and monitoring in physical logbooks. The authors developed an electronic logbook available for multiple platforms and tested its efficacy and usefulness.

Materials and Methods: The authors collaborated with professional mobile application developers to create an electronic logbook according to a pre-established set of goals of 1. Ensuring a standardized training program, 2. Permits supervisors monitoring of trainee's progress and performance throughout the duration of training, 3. Applicable to educational settings with multiple sites and 4. The development of the logbook incorporates the perspectives of all users and stakeholders, and is adequately integrated into the user's training program. The logbook was tested during October 2017-2018, then distributed for practical use between October 2018 – March 2019.

Results: Forty-two volunteer logbook users were enrolled in this study, of which, 28 users (66.7%) are residents and 11 users (26.2%) are ophthalmology staffs and 3 users (7.1%) are educational administrators. At the end of the designated testing time, all participants responded to a 12-component satisfaction questionnaire which was based on a checklist for successfully implementing logbooks into clinical training by K. Schuttpelz-Brauns et al.. The questionnaire were 5 grading scale from the most satisfaction (5) to the least satisfaction (1). All the results were shown in full paper, which the authors also included the overall satisfaction of the logbook where 13 participants (30.9%) satisfied logbook the most, 18 participants (42.8%) were quite satisfied, 10 participants (23.8%) were in between, and 1 participant (2.3%) had the least satisfied into the logbook.

Conclusion: A web application based logbook has the advantages of ease of access and usage, monitoring and data presentation and a communication platform between residents and educational supervisor. All of which supports a training program which is capable of constant career and personal improvement and development.

Keywords: logbook, web application, ophthalmology

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Introduction

The postgraduate education in the field of ophthalmology has a duration of 3 years in Thailand. Residents enrolled in the program are assigned to record procedures and clinical encounters throughout their training via

logbooks as required by the Royal College of Ophthalmologists of Thailand (RCOPT).

In the past, physical logbooks were used with limitations of being lost, compliance issues or inadequately recorded as they were not always immediately accessible to residents. Which hindered a resident's capacity to self-assess, reflect and consolidate one's knowledge in addition to difficulties for educational supervisors to monitor the progress of residents. Hence the advent of the electronic logbook in the form

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of an electronic software available to mobile platforms connected to the internet to ensure the accessibility of the logbook to residents at any time and place.

Methods

The authors worked with the application development team to establish the following goals and applied concepts for the logbook that was produced:

1. The logbook ensures a standardized training program^{3,4,8}
2. The logbook provides educational supervisors with the trainee’s progress and performance throughout the duration of training^{4,7}
3. The logbook’s utility is enhanced in educational settings with multiple sites²
4. The development process of the logbook must incorporate the requirements and perspectives of all users and stakeholders, and is adequately integrated into the user’s training program for maximum effectiveness^{5,6,7}.

Once the application of the logbook was developed – the authors evaluated and tested the product to improve the application during October 2017 – 2018. After which the logbook was then distributed to residents and consultants who volunteered to use the logbook in practice between October 2018 – 2019.

The logbook application is accessible via the following IP address: 167.99.69.70/login volunteers will receive a username and password which may be personalized.

With regards to practical implementation, volunteer users are instructed by the authors prior to actual usage. Residents record procedural details in their logbook and sent the submitted information to their designated educational supervisor for evaluation. Volunteers who hold educational administrative positions monitor the resident’s logbook usage and compliance, with statistical reports,

Once the application was adequately tested, the authors conducted satisfaction questionnaire for the target users and stakeholders, which was used for further implementation and improvement.

*Note: the IP address may be subject to change in the future.

Results

The authors have developed a web-based application logbook with the aforementioned specifications in the methods section. It can be accessed via any electronic platform connected to the internet. Information stored in the logbook can be accessed and analyzed in an individual basis.

Forty-two volunteer logbook users were enrolled in this study, of which, 28 patients (66.7%) are residents and 11 (26.2%) and 3 associated educational administrative staff (7.1%). All 42 participants used the logbook for the aforementioned duration. At the end of the designated testing time, all participants responded to a 12-component satisfaction questionnaire which was based on a checklist for successfully implementing logbooks into clinical training by K. Schuttpelz-Brauns et al.¹ (Table 1.)

For each component in the questionnaire, the response is split into 5 levels (from most satisfied to least satisfied, most agreed to least agreed.) Each component is aimed at assessing positive attributes to a successful logbook as seen in tables 2 - 4.

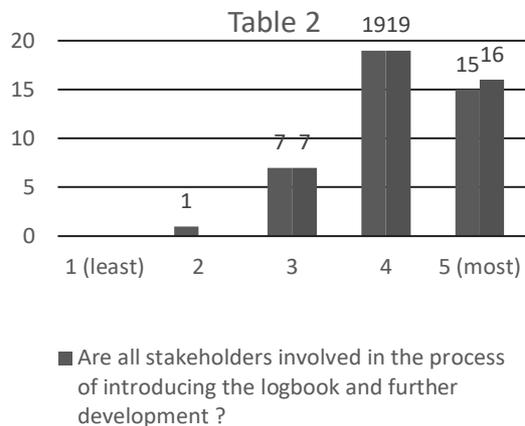


Table 2. Shows the satisfaction of all participants in the involvement in the aspect of integration of views and perspectives of all stakeholders in the development and management of the logbook.

Table 1. Checklist for successfully implementing logbooks into clinical training

<p>Tip 1 : Use all resources you can obtain and do not repeat work that has already been done</p> <ul style="list-style-type: none"> - Does a logbook for your discipline and stage of education already exist? - Does it fulfil criteria of the tips 3-5? 	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
<p>Tip 2 : Involve all stakeholders and embed the introduction of logbooks into a change management process</p> <ul style="list-style-type: none"> - Are all stakeholders involved in the process of introducing the logbook and further development (supervising physicians, mentors, students)? - How do you ensure transparency of the whole process? 	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
<p>Tip 3 : Keep it short, simple, and precise</p> <ul style="list-style-type: none"> - Are all objectives listed in the logbook really important? - Are the basic skills and learning objectives exactly defined? - Is additional information included (such as frequently needed knowledge of the discipline or contact details of supervising physicians and mentors)? - Does the arrangement of data allow timely and easy analysis? 	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
<p>Tip 4 : Mind legal issues</p> <ul style="list-style-type: none"> - Do you take copyright/ownership of your country into account? - Do you take data security of patients into account? - Do you take data security of trainee into account? 	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
<p>Tip 5 : Use a handy logbook format</p> <ul style="list-style-type: none"> - If you use paper-based logbooks: is it pocket-size? - If you use electronic logbooks: do you have an appropriate IT? - Is the logbook of low cost? 	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
<p>Tip 6 : Make the logbook an integral part of the curriculum</p> <ul style="list-style-type: none"> - Are the learning objectives of the logbook part of the curriculum? - Are the learning objectives of the logbook part of the curriculum in lectures and seminars (Miller-Level 1 and 2)? - Are the basic skills and learning objectives of the logbook part of assessment? 	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
<p>Tip 7 : Mentor and supervise learning objectives</p> <ul style="list-style-type: none"> - Is there regular communication and supervision via logbook between doctors and students? - If in addition to the supervising physician, there is a mentor involved in the training process: is the logbook used to evaluate the learning process? 	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
<p>Tip 8 : Provide time and space for teaching and learning</p> <ul style="list-style-type: none"> - Do supervising physicians and mentors have enough time to supervise and to mentor? - Do trainees have enough time to read, to study and to work with the logbook? - Does the head of the department accept and support the logbook? 	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
<p>Tip 9 : Establish an easy going workflow</p> <ul style="list-style-type: none"> - Did you contact involved staff to find the best way to distribute, collect and evaluate the logbook? - Does your workflow involve following activities around the logbook: printing, storing, handing over, explaining, collecting, reviewing and updating? 	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p>

<p>Tip 10 : implement an evaluation cycle to optimize logbook-location-fit</p> <ul style="list-style-type: none"> - Is the evaluation used to improve the curriculum of the clinical setting? - Do you give timely feedback to the students? - Do you give timely feedback to faculty? - Do you give timely feedback to the supervising physicians? - Does the evaluation show the contribution of supervising physicians and mentors to the learning of the trainees? 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<p>Tip 11 : Inform staff and trainees</p> <ul style="list-style-type: none"> - Did you inform trainees about function and content of the logbook (best face to face)? - Did you inform concerned staff about function and content of the logbook (e.g. physicians, head of department, nurses)? - Do you plan regular information session for concerned staff? 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<p>Tip 12 : Train supervising physicians and mentors</p> <ul style="list-style-type: none"> - Do you inform about the structure, content and aim of the logbook? - Do you provide regular, short training of supervising physicians and mentors? 	<input type="checkbox"/> <input type="checkbox"/>

Table 3. shows the satisfaction in the aspect of the ease of use, compact design and clarity of information presentation in the logbook

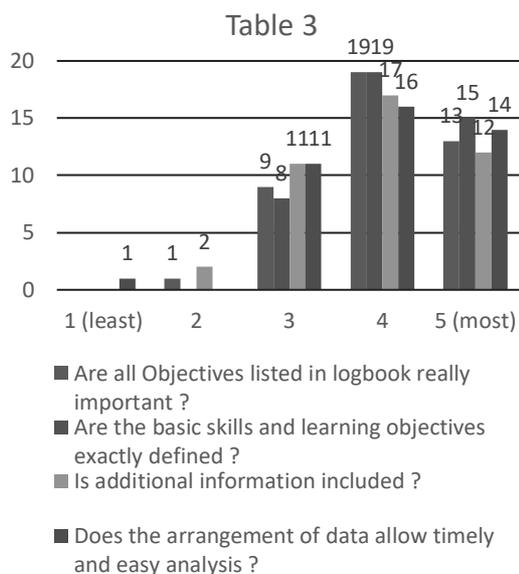
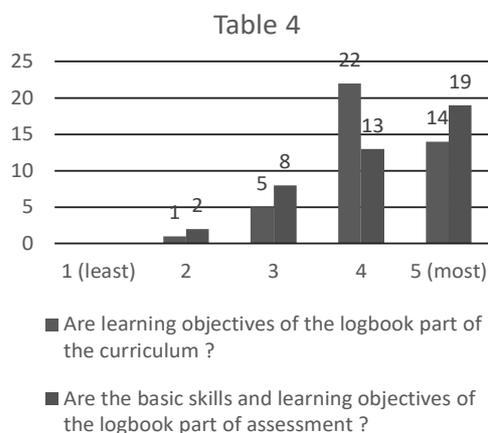


Table 4. shows the satisfaction of participants with regards to the clinical logbook's positive impact and effective integration into the clinical training program



Furthermore, the authors have evaluated the participant's impression of the logbook in other aspects that has not been illustrated in this study.

1) The logbook has been developed to be mobile based: 19 participants were most satisfied with the logbook (45.2%), 14 were very satisfied (33.3%), 7 were moderately satisfied (16.7%) and 2 were less satisfied (4.8%)

2) The communication between the program implements and participants and support was effective during the logbook implementation program trial period: 7 participants were most satisfied (16.7%). 19 were very satisfied (45.2%), 12 were moderately satisfied (9.5%) and 4 were least satisfied (9.5%)

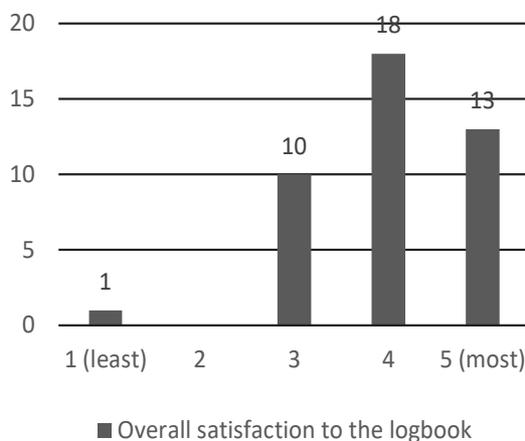
3) The assessment and monitoring of

residents enrolled in the training by educational supervisors were useful for further development and improvement of the clinical training program: 16 participants were most satisfied (38.1%), 16 were very satisfied (38.1%), 7 were moderately satisfied (16.7%) and 3 were less satisfied (7.1%)

4) The guidance provided by the program implements toward participants and support was effective during the logbook implementation program trial period: 9 participants (21.4%) was most satisfied, 16 was very satisfied (38.1%), 12 were moderately satisfied (28.6%) and 3 were less satisfied (7.1%) and 2 were least satisfied (4.8%)

The authors also surveyed the overall satisfaction of the participants as seen in in table 5.

Table 5. Overall satisfaction of the logbook



Discussion

The development of the web application based logbook was based on the research of K. Schuttpelz-Brauns et al. which revealed important aspects of what makes for a good logbook. This study demonstrates that the product logbook contains all of the aforementioned specified features which has been supported by the generally positive impression by the participating users. Which provides grounds for the authors to believe that the Web based application logbook can replace the traditional physical logbook that has been used in ophthalmology departments.

The positive characteristics of this developed logbook consists of its effectiveness, ease of access and usage, increased capacity in

monitoring progress of residents, and provides a platform of sharing and communication between residents and educational supervisors about the trainees progress for career development and self evaluation purposes throughout their training duration.^{2,3,5,6}

The author's findings indicate that the participants are satisfied with the logbook in its utility, its state of readiness for implementation in practical use, however there is room for constant improvement which will require more participants to provide further data for future development.

Conclusion

A web application based logbook was developed to replace the traditional paper-based logbook which that has been used in residency training in ophthalmology. With the advantages of ease of access and usage, monitoring and data presentation and a communication platform between resident and educational supervisor. All of which supports a training program which is capable of constant career and personal improvement and development.

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