

# The MYS Pilot Project for Biblical Hebrew: the public report

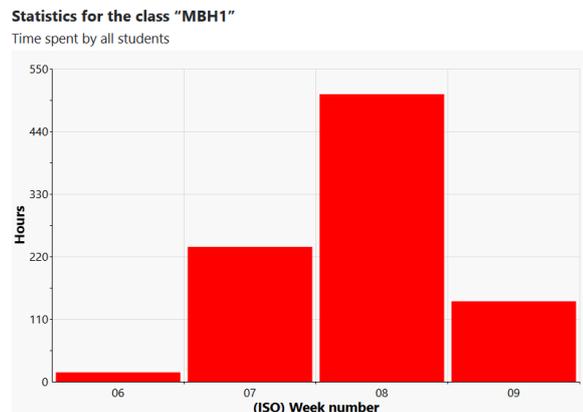
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This is a public and revised version of a report summarizing the results obtained in the Mekane Yesus Seminary (MYS) Project for use of Bible OL for Biblical Hebrew. The goal is to describe how successful the learning outcomes were, as well as describe in some general terms what should be improved in a another similar project.<sup>1</sup>

## The three phases of the project

It was required by the MYS that the project should run over 2 months to fit the curriculum and as such it was implemented from February 4 to April 4 2019. It also covered three distinct phases of internet access, through normal existing internet, with mobile 4G network and with introduction of two mini-servers, that worked offline.

- **Phase 1: February 4-28:** I was informed in advance that MYS had computers available for the students. Unfortunately, the project did not have an alternative to internet access in the first phase due to technical problems with installation. My teaching assistant, a Ph candidate from the Ethiopian Graduate School of Theology advised me to invest in mobile 4G network (about 200 dollars per month). This improved internet access considerably, and students in the class managed to get their total working hours up from about 15 hours in the first week, 250 hours in the second week, 500 hours in the third week, and 135 hours in the final week. The lower figures in the last week was due to the fact that students had other subjects taught during the week, and we spent much time in the class on a competition between 5 groups of learners.



**Figure 1. Practice by class before, during and after 4G solution.**

- **Phase 2: March 1-11:** I returned to Denmark for 11 days and worked on a solution for the slow and unreliable internet access. During this period, the students did not have 4G internet,

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<sup>1</sup> I would like to thank Promissio, and especially coordinator of missions Simon Schøler Kristensen for support for this project even back into the days of the project in Madagascar. My grateful thanks also go to the Mekane Yesus Seminary and its president Dr Bruk as well as my teaching assistants, and last, and certainly not least, to my wonderful students and fellow learners in the project.

and the class activity dropped to 250 hours of work, a decrease to a quarter of the earlier learning activity performed by the class.

- **Phase 3: March 28-April 4.**

Due to Mid-Term exams and other obligations on the students, the regular class schedule was resumed only on Thursday March 28, and this left only one full week for active Hebrew learning until the final exam by Wednesday April 3 at 18:00.

During my class hours I constantly trained learners in doing Bible Online Learner exercises and I focused on active involvement by the students.<sup>2</sup>

The most important conclusion on the setup of the framework for the pilot project is that both students and facilitators must be available full time and mutual expectations and obligations must be carefully defined well ahead of upstart of a project.

### **Enhanced performance through mini-servers.**

In the third phase of the project two new Raspberry Pi mini-servers overcame almost all the problems students had with internet access prior to this major improvement of the project.<sup>3</sup>

The new mini-server solution was announced already in the Summer of 2017.<sup>4</sup> PhD-student Judith Gottschalk had managed to set up a [Raspberry Pi 3 computer](#) (an RPi server) as a server to support an offline local network running Bible OL independent of the internet. Prior to that she did her first experiments on a laptop in Madagascar, but the new RPi server is much smaller and cheaper and hence more sustainable for the African context. Gottschalk demonstrated this new device at Society of Biblical Literature International Meeting in Berlin in August 2017. The server runs an operating system on a micro-SD card and can support language learning on smart phones, tablets and computers, and it was set up to work offline. Gottschalk demonstrated this solution at various venues, and it convinced an advisor for Global Learning Initiative, the general secretary of the Danish Mission Council, Dr. Jonas Adelin Jørgensen, that the RPi-server has huge potential for theological education in the Majority World.<sup>5</sup>

In July of 2017 we predicted that “[e]ventually this can become a learner-friendly and affordable advanced persuasive technology for the global learner.” This is indeed what we have now seen demonstrated in Ethiopia during the third phase of the project, providing a proof of concept for this new solution. We were able to test the RPi and found it to be a very strong sustainable and portable

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<sup>2</sup> The class environment is documented with videos at well <https://global-learning.org/mod/forum/discuss.php?d=51>

<sup>3</sup> See “Bible OL running on Raspberry Pi in Addis” published by Nicolai Winther-Nielsen Thursday, 11 April 2019 at <https://global-learning.org/mod/forum/discuss.php?d=50>.

<sup>4</sup> See “Bible OL to run on credit card size computer” published by Nicolai Winther-Nielsen Thursday, 11 April 2019 Saturday, 8 July 2017, at <https://global-learning.org/mod/forum/discuss.php?d=29>

<sup>5</sup> See “Jonas Adelin Jørgensen praises Swahili Bible OL at Nyakato” published by Nicolai Winther-Nielsen Saturday, 8 September 2018 at <https://global-learning.org/mod/forum/discuss.php?d=48>. Dr Jørgensen sums up: “Our visions is to offer a mobile seminary for theological education that costs less than 100 Euro. We also believe that Bible translation teams working in hard remote areas with expensive, unstable or even non-existent internet will now be able to have state or the art technology for theology. The Bible OL Pi server has been able to support more than 20 users. It is a very robust solution for African settings.”

solution and the MYS project provided two mini-servers that can improve the learning environment for the students at the seminary.

Hence, the use of the RPi-server has passed the test with flying colors. Even if students only had time to use this solution extensively for a week during the third phase, they were able to improve their workload and learning outcomes dramatically. Many students who had prior to this been slowed down by restricted or inferior internet connection now were able to perform extremely well.

The successful introduction of mini-servers is by far the essential technical improvement in the MYS project, and we know can compare performance up against mobile 4G (phase 1), normal Wi-Fi (phase 2) and an offline mini-server solution (phase 3).

## **Performance tracking and grading**

The evidence from the performance tracking of the learners is our main reason to claim that learners could improve their grade by using the new Raspberry Pi offline access to Bible OL. This grading was done by collecting the result on all correct answers (accuracy), the number of questions (depth) and the number of answers per minute (speed). A high score on all these parameters indicates an indisputable automatization of language skills.

The grading at MYS was based on the recorded data from exercises in Bible OL, but the final grade could only be estimated from manual collection of data and a calculation of the final grade. It took considerably more than 10 hours to collect all the data from Bible OL for the 6 proficiency tests of all 30 students and then sort these data, lump them together, evaluate them and then estimate the final grade.

The tasks involved in this grading are two proficiency tests on performance after some 110 hours work. In proficiency test 1, the students had to train the first 101 vocabulary words, noun declension, suffixes on prepositions and the pervasive Hebrew (*way*)*yiqtol* verb conjugations. Proficiency test 2 included tasks on the next set of vocabulary items up to the 202 most frequent Hebrew words, suffixes on singular and plural nouns as well as on all prepositions, the verb in all forms of *qal*, and the vocabulary in Genesis 1.

For all 30 students it was possible to collect data on correct answers, number of questions during a day and the number of questions answered per minute. I had to copy-paste the data into Word documents, and then manipulate them manually in tables, before I had access to the data, as illustrated for one learner in Table 1.

The problem in this kind of collection of big data, is that the numbers have to be processed according to quality standards. A student may very well get 100 % correct answers without knowing the language well. Most students can do 100 % correct answers on the same small number of questions, like 5 at a time. If answers are based on only one single answer per minute, the student will have time to consult with the course literature or other learning resources. It does not give the correct and reliable plotting of what the learner masters as a skill, in contrast to what the learner can figure out with relative precision, but without automatization of skills. Only when there are correct answers of a considerable number of questions per minute can we assume that the learner in question has achieved a high level of language proficiency.

**Table 1. Data for an elite student at MYS**

The data reflects how many % correct answers were given (Corr), the number of questions answered (Ques), and how many questions were answered per minute. The date is recorded, and a grade is assigned manually.

PROFICIENCY 1	February	Corr	Ques	P/Min	March 23	Corr	Ques	P/Min	Gr	Later	Corr	Ques	P/Min	Gr		
02_Vocab		100%	40	4.6	A	2019-03-21	98%	435	3.4	A	2019-03-21	98%	435	3.4	A	
03_PoSb		100%	46	7.7	A	2019-03-21	100%	43	8.9	A	2019-04-03	98%	136	15.9	A	
04_Nouns		100%	51	10.6	A	2019-03-21	100%	6	7.3	A	2019-03-24	0%	516	29.0	A	
05_Suff		100%	51	9.2	A	2019-03-22	100%	60	10.9	A	2019-03-22	100%	60	10.9	A	
06_Verbs		100%	45	13.0	A	2019-03-22	100%	291	25.8	A	2019-03-22	100%	60	9.5	A	
<b>PROFICIENCY 2</b>	<b>April 3</b>				<b>Final grade</b>											
Vocab202	2019-03-22	100%	49	1.3	A 99	A										
Vocab202	2019-03-23	100%	45	1.5												
Vocab202	2019-04-02	100%	28	2.4												
NounSuf	2019-03-23	100%	51	11.9												
NounSuf	2019-03-28	100%	321	11.9												
NounSuf	2019-04-02	100%	99	14.7												
NounSuf	2019-04-03	100%	486	15.7												
PrepSuf	2019-03-23	100%	48	10.2												
PrepSuf	2019-03-28	100%	318	12.6												
RegQal	2019-03-23	100%	40	6.9												
RegQal	2019-04-02	99%	708	7.9												
Gen1	2019-03-23	100%	42	5.1												
Gen1	2019-03-28	100%	156	3.7												

The task of the grading is then to figure out to what extent a high percentage of correct answers reflect a high grade. For this reason, some of the data were dismissed as not useful for grading, others were treated with some suspicion, yet others were highlighted as of indisputable value. During the project I learned that I will have to take speed for number of questions far more into account.

**Table 2. Revised grades based on correct answers**

No. of students	Calculated percentage and number of students in parenthesis	Grade assigned
10	99 (2), 98 (1), 97 (2), 96 (2), 94 (3)	A
2	93 (1), 92 (1)	A-
10	89 (7), 88 (1), 87 (2)	B+
3	86 (1), 85 (2),	B
2	81 (2)	B-
1	73 (1)	C
1	69 (1)	D+
1	50 (1)	F

Such results from grading are almost too good to be true.<sup>6</sup> Only time will tell, to what extent these 29 students will be able to perform this well when they continue to study Biblical Hebrew. Also, in the long run an oral exam will have to be required in order to verify these exceptionally high performance results. In the optimal situation, a teacher should assign an approximate grade, like A, B, C or D based

<sup>6</sup> However, a somewhat similar outcome emerges from my blended learning classroom in Copenhagen. After a 560-hour course on Biblical Hebrew 61,5 percentage of the students got the grade B or higher. See my account: "Copenhagen class did well in exam" by Admin User Thursday, 3 January 2019 at <https://mbh.3bmoodle.dk/mod/forum/discuss.php?d=7>

on impression of overall proficiency. The final grade will then depend on either a traditional sit-in written exam or an oral exam that will confirm skills for reading, translation and grammar.

## **Persuasive learning – the outcome**

The most promising outcome of the project was that students right away understood the potential in learning through persuasive technology.

During interviews students explained how they had been told in advance that it is not possible to learn Biblical Hebrew, but they could and they were excited that they could successfully read the original language of the Hebrew Bible at the beginners' level. Students quickly grasped the basic principles of the design for persuasive learning developed for Bible OL. They grasped the core of learning in a practical way, and experienced how language learning is fun, it is like a game. One student also fully grasped the concept of deep learning: "When we repeat the word again and again, that word is saved in our mind".

Several important approaches were tried out in the MYS classroom. I divided the students in teams of 6 in order to make them mutually dependent on common activities for learning. These 5 learning teams were used for several crucial learning tasks:

1. **GAMING:** Before the proficiency test 1, and at the end of the first month, I announced a Bible Olympics. The 5 teams would have to compete on writing personal names from the Hebrew Bible. This task created a strong gaming atmosphere and a lot of fun, and students worked literally day and night in order to beat the other team. The games were a very pleasant experience and a prime example of how persuasive technology can be enhanced by gamification.
2. **INTERPRETATION TASKS:** After the proficiency test 2, the local teacher of exegetical methods and I arranged for the learning teams to use their skills to translate and interpret two passages from the creation account in Genesis 1. This extremely relevant task-based language learning project proved to the students that they have acquired knowledge that could be used for their future work as Bible translators or expositors of the Hebrew Scriptures
3. **TEACHING ASSISTANT TRAINING:** I took initiative to train students to take charge of peer-based learning processes. On several occasions I used a gifted female student as a teaching assistant in order to have her explain her own way of learning to her fellow students. It proves that Bible OL works very well as a tool for peer-based learning, and it illustrates how teaching assistants often are central facilitators for Bible OL. They have trained for hundreds of hours and developed their personal skills for language learning through Bible OL. They can do the instruction in the mother-tongue language and they can share their practical hints. They have practiced more than most of their teachers.
4. **INDIVIDUAL SUPERVISION.** One of the strengths of Bible OL is its ability to plot the performance of the students. I shared these performance data within the class by using anonymous IDs. Even if some students knew the IDs of other students, making performance data available in class was a challenge only for very few students. When learners know that such accurate data are available, it not only motivates them to improve their own performance, but they also will try to compete with the high performers. Bible OL in this sense offers a very transparent and ongoing assessment system that rewards learners for their investment of time and efforts in actively acquiring knowledge.

5. **SOCIAL LEARNING.** Even if I tried to support the students to collaborate in learning teams it is my impression that these students tend to learn as a social group and they will almost naturally practice peer-based learning, taking responsibility for each other. It is not clear whether this holds for just this class or just for Ethiopian students, but perhaps Bible OL by and large will support a social collaborative learning mood that will help Africans learn collectively. However, in this regard, they seem to differ from most students in Copenhagen who seem to learn more individually. However, because every student can practice freely, guided by instant feedback and ongoing assessment, they can find their preferred learning-style and are free to focus on relational dimensions for learning or do individual projects they prefer.

This is only a pilot project and it is restricted to a small group in Ethiopia, but we expect that the results in Copenhagen and in the MYS project can be scaled up to Hebrew language learning in many other cultures and learning environments.

### **Evaluation of future potential**

The outcome of the MYS project is that two fully functional mini-servers are now available for learners in the IT lab of the seminary. Several scenarios are open for scale-up and continuation.

- **TEACHER-TAKE-OVER.** I worked with a teaching assistant and a local teacher. However, it is my impression that facilitators must have much more extensive training and supervision, and especially do the same tasks as the students. It is not clear that online supervision will be sufficient, unless a local facilitator is very experienced and fully committed.
- **STUDENT-TAKE-OVER.** Some of the best students will know how to continue to practice on their own, without any Hebrew instructor or supervision. This Some of the best students should be given tasks as teaching assistants.
- **PROTECT-IMPLEMENTATION**
  1. Two-week intensive courses at regular intervals (semi-annually) in order to introduce new phases of the Biblical Hebrew course and to supervise training of teachers and teaching assistants.
  2. Employ teaching assistants trained in Copenhagen or online during the 560 hours of *My Biblical Hebrew*.
  3. Local teachers who have passed the full 560 hours of *My Biblical Hebrew* could be supervise through an online advanced course of Biblical Hebrew.

From the learners' point of view the MYS project was a very successful initial stage in setting up a new Hebrew language course. The project also gave invaluable feedback on what to focus on what to avoid when implementing anything similar in the future. When improvements are implemented and a mutually agreed on long-term strategy is agreed on, it will be possible to improve the level of Hebrew knowledge even at bachelor level through our new technology, combined with the blended learning offered at regular intensive courses. However, implementing this new course model may require substantial changes in schedules and curricula and a new focus on active, online and collaborative learning.