

# Everyone needs a leader:

## A "Flipped Classroom" Model

### Based on Premium MOOC courses<sup>1</sup>

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This article presents our approach to the design of nine MOOC courses produced to date at Tel Aviv University, and to implementing four of them, based on the Flipped Classroom model. The rationale behind this approach is driving change in the value proposition delivered to learners, and adapting this proposition to the digital age – thereby offering a better and more active learning experience compared to the traditional teaching method. This new learning experience - digital, personal and holistic, is achieved through extensive investment in technology, design and pedagogical tools. The resulting Premium MOOC courses become the backbone of the Flipped Classroom model, enabling the in-classroom teaching to be more meaningful, and also more flexible, thus making it easier to adapt to different needs. This article presents the method's seven underlying fundamental principles. One focal principle is that the teacher serves as a leader who guides the blended learning process, and creates an enriching in-class learning experience that complements the digital learning component.

### The Flipped Classroom model

The digital revolution impacts and remodels almost every aspect of our lives, and higher education systems are no exception. In particular, the traditional value proposition<sup>2</sup> to students at these institutions – acquiring an academic degree by learning through lecture-style instruction in a physical classroom – is undergoing a significant change. However, unlike other areas, the change in this value proposition is relatively slow, and the traditional learning environment is still with us. Over the years, various digital models, such as synchronous and asynchronous e-learning, have been developed as alternatives for traditional teaching. However, for various reasons, online learning is difficult for many students. Some of

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the reasons are: lack of a clear incentive, lack of self-discipline, lack of a concrete timeframe and definite examination date, lack of interaction with a teacher and classmates and more.<sup>3</sup> Even the MOOC format - the new generation of online courses that has taken us by storm - has not been able to effectively solve these challenges, and statistics indicate that most of those who embark upon independent learning of a MOOC course (90%) will not complete it<sup>4</sup>.

The Blended/Hybrid Learning model, and especially its application in the Flipped Classroom, has been perceived in recent years as the most promising model for replacing the traditional learning model, in a way that will improve the quality of learning. This model combines two complementary components: the digital base - independent learning of an online course, and the classroom element - learning in a physical classroom<sup>5</sup>. The advantage of the Blended Learning model lies in joining the 21<sup>st</sup> century learner's natural craving for innovation and digital development with his/her natural desire for human interaction. This fusion, however, raises a question: "Can two walk together, except they be agreed?"<sup>6</sup> In other words: is the human compatible with the digital? And if indeed they are agreed, what is the role of the teacher in the 21<sup>st</sup> century? And the mirroring question: what is the role of the student? Just like the application of any theoretical model, the implementation of this model has met with difficulties. Essentially, despite the utilization of the digital base component, the learning experience was not significantly altered, and the quality of learning did not improve. One possible explanation for the difficulties in implementing the model is that the base component - the online component, was developed in a relatively minimal fashion (no more than a video of a lecturer in the classroom, accompanied by a presentation), with no emphasis on the actual learning experience. In this way a type of 'digital textbook' was formed, conveying nothing but information. And when the digital component is not altered in any meaningful way, the classroom session based upon it cannot soar to new dimensions - remaining much the same as the traditional classroom with lecture-mode instruction. . Another possible explanation is that this is not a truly new model, but rather a replica or a new name for the old teaching model, in which students were asked to prepare for the lesson by reading study materials. Similarly, students in the Flipped Classroom are required to watch the online course before coming to class, and if the "average" student does not prepare for class, the model doesn't work very well.

I believe there is another explanation for the difficulty in implementing the Flipped Classroom model (and using it to improve the quality of learning): the depth of change it requires. The Flipped Classroom model requires the teacher to do something very different in class - something that is not simply "passing on knowledge"; the student is also required to prepare for class in a different way, and then participate actively rather than listen passively. In other words, the students expect a "new" teacher, who will offer diverse and creative ways to help them in the learning process; and at the same time, the teacher expects "new" students, who will learn independently before class, through the online course, and know the material. We have here a fundamental change in the definition of the teacher's role, a fundamental change in the student's responsibility, and consequently also a change in the fundamental contract between teacher and student. And yet, both teacher and student may not have been trained for these far-reaching changes, or, for that matter, for the Blended Learning model itself. For example, a student required conducting independent online learning with no guidance or assistance, may find this difficult, and consequently might come to class unprepared.

Since what we have here is a new learning process, we must prepare for the model's implementation in a different manner. The approach developed at Tel Aviv University assumes that only considerable investment in the digital stage will enable the desired change - a better and more active learning experience that truly alters the value proposition to the learner, adapting it to the digital age. This

investment is expressed in the definition of the digital base component: we do not build a *digital textbook*, but rather a *personal, holistic digital learning experience*. By *personal*, we mean an online course that generates engagement, stimulating the learner both emotionally and cognitively. This is a course built right from the start for students who will watch it on a screen (computer or cellular), not a course which is merely a video of a lecturer in class, speaking to other students.

By the term *holistic* we mean that the course is a standalone entity – the lecturer has left no contents or explanations for the classroom stage. Quite the contrary: the course is intended to contain all contents and explanations, as well as the lecturer's pedagogic experience in passing on knowledge. When the online course is richer, and better adapted to independent learning, students will be more involved and engaged in the physical classroom. Such a course will also open new creative possibilities for the teacher in his/her encounter with the students, creating a *new interactive and dynamic learning space in the classroom*.

The description above seems to raise a certain paradox: since teachers are required to transfer all their unique qualities – their teaching experience – to the online course, isn't the teacher redundant in the classroom? We believe that far from becoming redundant, the teacher's presence is more significant than ever. Contrary to the concern that we may be stripping teachers of their essential assets, and leaving them exposed in the classroom, we are in fact freeing them from a heavy burden that has always hampered the teaching process: the time previously devoted to passing on knowledge can now be dedicated to managing classroom dynamics, creative teaching, and, under suitable conditions, even personal support for each student's style of learning. Unshouldering the burden of passing on content, the teacher expands the tools at his/her disposal in the classroom, making room for better acquaintance with the class and students, and focusing on the essence of his/her profession – teaching. This in accordance with the principles of the constructivist educational theory, which describes a learning environment devised to build knowledge, rather than transfer knowledge<sup>7</sup>, and includes a vast range of creative approaches, such as in-depth investigation, enrichment, examples, gamification or any other methodology.



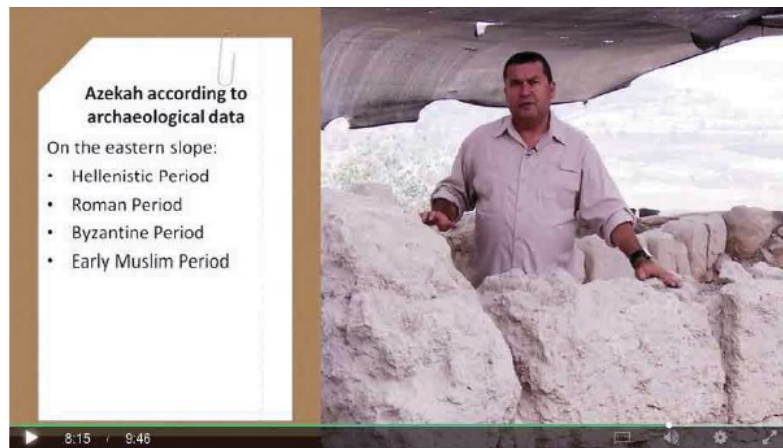
In the studio

Prof. Oded Lipschits, Coursera MOOC course – The Fall & Rise of Jerusalem, Tel Aviv University

## The Flipped Classroom model at Tel Aviv University

The Flipped Classroom model at TAU is founded upon a base component of Premium MOOC courses, in which a great deal has been invested: budgets, the time it takes to build each course, and the team of experts involved in its construction. The development of these Premium MOOC courses involves completely "taking apart" the original course as it was delivered in the classroom, in order to learn, define

clear goals, write a cohesive script, shape a graphic and visual line that serves the pedagogy (8), and ultimately reconstruct the course to create a personal, holistic digital learning experience, as described above. To do this we need a team of experts that includes a lecturer, a producer, an instructional designer and a video editor. The building process includes writing a script, filming the lecturer in a special studio (not in the classroom), outdoor filming, filming labs and experiments, interviews with guest experts, incorporating photos and clips from various media sources and animations. All this is edited professionally, and we also obtain any needed copyright licenses and provide translations<sup>5</sup> (see details below). The full process ensures the Premium quality of the course – maintaining a high academic level on the one hand, while making it accessible and coherent for students contending with new and complex academic contents.



At Tel Azekah

Prof. Oded Lipschits, Coursera MOOC course – The Fall & Rise of Jerusalem, Tel Aviv University



Lab experiment

Prof. Abraham Kribus, Coursera MOOC course – Introduction to Renewable Energy, Tel Aviv University



Lab demonstration

Following are some examples of special elements incorporated into our MOOC courses:

**Interviews with guest lecturers:** In our course "Viruses & How to Beat Them", offered by Prof. Jonathan Gershoni from the Faculty of Life Sciences, we included interviews with three Nobel Prize Laureates.

**Labs:** Zoom-in films and photos of devices and measurements in various processes. For instance, MRI, EEG and TMS labs were shown in Prof. Galit Yovel's Introduction to Psychological Science.

**Experiments:** Practical testing of theoretical principles via experiments and demonstrations requires a great deal of preparation<sup>9</sup>. For example, Prof. Ron Lifshitz's Basic Notions in Physics features over 40 filmed experiments.

**Outdoor filming:** Visiting outdoor sites associated with the lecturer's activities and/or a topic discussed in the course creates a special atmosphere. For example, in *The Fall & Rise of Jerusalem*, offered by Prof. Oded Lipschits from the Department of Archaeology, we filmed at Tel Azekah, to show its strategic geographical location.

**Animation:** Illustrating complex and/or highly detailed concepts via animation. For instance, in *What a Plant Knows*, taught by Prof. Daniel Chamovitz of the Faculty of Life Sciences, we created an animation clip of a plant which, attacked by an insect, sends warning signals to neighboring plants.

The considerable investment of effort, time and budgets, alongside the fruitful pedagogic dialog with our team of experts, generate lucid, tightly formulated MOOC courses, with clearly defined learning goals and a coherent, carefully layered structure. Our Premium MOOC courses thus provide the Flipped Classroom model with an essential backbone, enabling classroom sessions of high quality that are sufficiently flexible to meet changing needs. For example, the teacher in the classroom may choose to use a recent event to illustrate a scientific principle presented in the MOOC course. A Premium MOOC course also permits other teachers to teach the course, while adapting it to their classes, and adding their own angles. One such program is Online Academic High School, in which high school students take TAU's MOOC courses, acquiring academic credits as they study for their matriculation exams.

So far, TAU has developed nine Premium MOOC courses, four of which are being taught in the Flipped Classroom format. Classroom sessions take place in large classes of over 80 participants, three to four times during the semester, led by the lecturer of the relevant MOOC. When in class, the lecturers teach in the traditional lecture mode, while creatively applying a range of pedagogical approaches, as described in the fifth principle below.

The courses are conducted within the framework of TAU Online – the Learning Innovation Center at Tel Aviv University<sup>10</sup>. TAU Online is responsible for building the University's digital pedagogy vision, including the development of methodology for producing Premium MOOC courses and the implementation of Blended Learning, in order to achieve optimal pedagogy. Since 2013 we have been applying Blended Learning practices, while continuously developing and improving the pedagogy – based on our accumulated experience, ongoing thought processes, and the participating teachers' passion for creating a more meaningful in-class encounter.

## **Underlying principles of the new approach**

### **First principle: Who is the target audience?**

As noted above, an online course cannot be a simple video of a lecturer lecturing in class to students equipped with presentations – just as a movie cannot be a video of a play performed in the theater. Students viewing such a lecture on screen do not participate actively in the event, and therefore cannot be defined as the course's 'target audience'. Students who are not the target audience are not 'activated', neither cognitively nor emotionally, and thus their engagement in the learning process is quite low. Nor can a MOOC course be a mere 'talking head' presentation of the lecturer in a studio. Even though a 'talking head' course does address the students viewing it on a screen, it represents a rather outdated format, compared to other contents we consume through the screen nowadays. A MOOC course must generate a personal and holistic learning experience for the student at home – and this is the challenge we must contend with. Such a learning experience must include a new and interesting on-screen event every 20

seconds (graph, animation, image and so on), thereby complementing and enriching the lecture and stimulating the student, both cognitively and emotionally.

### **Second principle: Dispelling the lecturer's isolation**

In traditional academic classrooms, the lecturer usually addresses the class in a way that is isolated from other faculty members. All too often, no other professional person or faculty member has assisted him/her in constructing the course (apart from consultations with colleagues), nor are they present in the classroom to give him/her pedagogical feedback. In contrast, lecturers participating in our MOOC courses are enveloped by a whole team of pedagogical experts, who closely scrutinize every sentence, paragraph and demonstration. This pedagogical dialogue generates a tightly fashioned course with clear learning goals and a course structure (learning map) adapted to its specified learning goals. For example: A traditional in-class lecture-based course of 13 sessions (one semester) is transformed into a 7-9-session online academic course; a 90-minute traditional classroom lesson becomes a 60-minute online lesson, consisting of several units of up to 10 minutes each; and so on. In other words, when reconstructing a course for an online format with the same learning goals, we create a course with the same content, but tailor its structure to its specific needs. There is no need to stick to the uniform traditional format of the 13-week semester.

### **Third Principle: It's never either or; always both together**

The two components of Blended Learning – the human and the digital – must each be allowed to "do what it does best", with their respective capabilities combined in an optimal way. This ensures learning of the highest quality.

**The human component:** The lecturer can lead the students, guide them and create mutual interactions – both between him/herself and the students, and among the students themselves. He/she is able to relate to the students' feelings, expressing care and empathy in a way no technology can.

**The technological/digital component** can deliver the study materials using special means, providing students with a richer, more personal learning experience than the average traditional class, at the most convenient time, place and pace.

### **Fourth principle: "Pedagogic alignment" – personalized learning**

The better prepared students are for the classroom session, the greater its potential for becoming interesting and meaningful. Preparing for class, students study specified chapters of the MOOC course, answer questions incorporated into the video (IVQ)<sup>11</sup>, solve quizzes and read texts. Such preparation is in effect Personalized Learning – with students learning at the time, place, and most importantly the pace that suits them best. Consequently, when they finally come to the in-class lesson, they are all aligned with one another – sharing the same knowledge base on which the lesson is built. The next stage (one of many) in Personalized Learning is adapting not only the pace of learning, but also the form of presentation and type of content to each student's style of learning<sup>12</sup>.



In the lab

Prof. Yoram Margalioth, Coursera MOOC course – Economic Growth & Distributive Justice, Tel Aviv University



In the studio

Prof. Yoram Margalioth, Coursera MOOC course – Economic Growth & Distributive Justice, Tel Aviv University

### **Fifth principle: What happens in class?**

In a Flipped Classroom based on a Premium MOOC course, the lecturer enjoys a precious gift – time in class – the most valuable resource in the learning process. Time in class is generated by the conversion of teaching in class into independent online learning elsewhere. This new time enables lecturers to experiment with different ways of teaching. In fact, the lecturers who took part in our Flipped Classrooms utilized the time in many different ways. For some this was a golden opportunity to let out the researcher inside them, presenting thrilling topics from their own scientific passions. Others chose to enrich their students with new materials – such as new developments that took place in the relevant field after the production of the MOOC course – thereby presenting the very latest frontier of research. Still others preferred to discuss topics which had been left out before for lack of time, or to solve problems, answer questions, delve into specific details, etc.

Thus, for example, in the course The Fall & Rise of Jerusalem, Prof. Oded Lipschits taught Biblical texts in class. He called his method "back to the good old 1970s, when the system had larger budgets." Prof. Yoram Margalioth, in his course Economic Growth & Distributive Justice, chose to link the theory – such as the definitions of public goods and market failure – with an analysis of relevant events in the news. Prof. Abraham Kribus used the MOOC lessons of his Introduction to Renewable Energy as a theoretical foundation for the classroom sessions, and Prof. Galit Yovel, in her Introduction to Psychological Science, both integrated and expanded upon the materials learned online.

### **Sixth principle: Teaching methodology & pedagogic flexibility**

In the fifth principle above (What happens in class?), several examples were given of the lecturers' pedagogic flexibility and creativity in the classroom. This gives rise to several questions: Are there any specific formulas or guidelines regarding the materials to be offered in class? Should the teacher expand upon the MOOC course? Provide relevant enrichment? Drill and apply the study materials? And since the teacher may choose his/her own way, another question arises: How should this be done? Through questions or discussions? Gamification? PBL (Project Based Learning)? Work in groups? The answer is that the flexibility principle cannot be packaged as one universal teaching methodology that is valid for every Flipped Classroom, every lecturer and every discipline. The mere attempt to formulate one recipe contradicts the very principle of flexibility. In addition, flexibility is also influenced by other factors, such as the size of the class<sup>13</sup>.

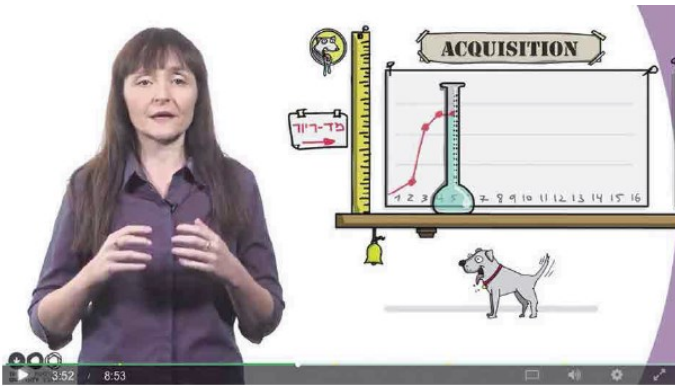
### **Seventh principle: everyone needs a leader**

Perceiving the teacher as a leader is not new. However, many teachers never really try to implement this idea, as they race against time in an attempt to teach all required materials in class. The flipped classroom model frees the teacher from the need to teach content, thereby giving him/her precious time to "lift his eyes up" from the text, and try to lead the class. Today we describe three prototypes of teaching models in the Flipped Classroom: the teacher as a coach, the teacher as a facilitator and the teacher as a curator. An important common denominator of all three models is the teacher's leadership - in aspects based on Adizes<sup>14</sup> famous leadership model. In each model, the teacher is the human element that organizes the Blended Learning process for the students and class, including the independent digital learning component. The teacher creates a classroom learning experience that supplements and organizes the digital learning – thereby solving some of the problems of independent digital learning noted at the beginning of this article. In addition, a group of learners led by a teacher who forms a structured framework – such as deadlines for assignments and a system of incentives (credits, grades etc.), creates a learning dynamic which also helps learners complete the course.

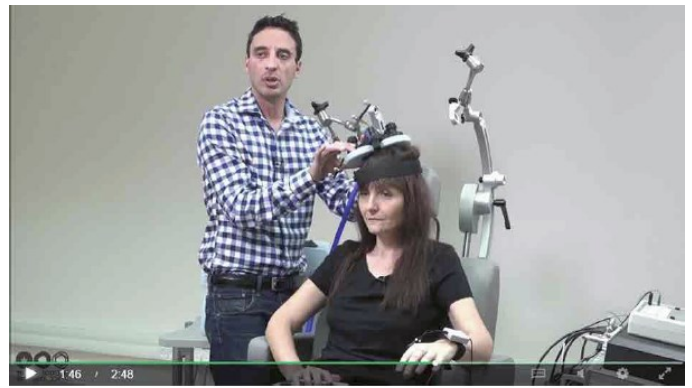
### **Summation of principles**

If at the beginning of the journey, some claimed that MOOC courses would eventually replace teachers, today it is clear that the MOOC course only increases the teacher's importance as a leader of the learning process. The Flipped Classroom model, when applied in its full and optimal form, "expands the production-possibility curve"<sup>15</sup>, utilizes both the human and digital components, and creates the *pedagogical flexibility and variation* needed in every classroom. This is the way to truly change the value proposition offered to the learner, and create a new contract between teacher and student. The teacher is not required to pass on knowledge to the student, but rather to facilitate the learning process, and the student doesn't just memorize information – he/she becomes an active, engaged learner, implementing and analyzing the study materials.





In the studio



At a TMS brain research lab

Prof. Galit Yovel, Coursera MOOC course – Introduction to Psychological Science, Tel Aviv University

## Where do we go from here?

MOOC courses are gradually taking their place as an important training method in the job market. However, in the academic world, they are still used mostly for disseminating knowledge to the general public, and only rarely applied as part of the academic curriculum. A significant breakthrough will be registered when universities begin to incorporate MOOC courses into their programs, especially as introductory undergraduate courses and large courses of over 100 students<sup>16</sup>. Today such courses, for the most part, do not provide the right, personal kind of learning experience, and the Flipped Classroom model may offer a real and desirable change (see the MIT Report<sup>17</sup>). We have no doubt that in a few years' time, the academic experience will be quite different than it is today, and hope that the right balance between the digital and human components will be found and maintained.

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1. MOOC – Massive Open Online Course – an online course aimed at unlimited participation.

<sup>2</sup> Value Proposition – the characteristics and needs of the organization's customers, and how the organization responds to these needs. From Kalman, Y.M. (2014). A race to the bottom: MOOCs and higher education business models. *Academic Teaching*, 4, 15-19.

<sup>3</sup> Kirsch, U. (2014). Massive Online Courses – Disruptive Innovation at the Universities?. Haifa. Samuel Neaman Institute for National Policy Research.

<sup>4</sup> Ho, A. D., Reich, J., Nesterko, S., Seaton, D. T., Mullaney, T., Waldo, J., & Chuang, I. (2014). HarvardX and MITx: The first year of open online courses (HarvardX and MITx Working Paper No. 1).

<sup>5</sup> Hativa, N. (2014). The tsunami of MOOCs: will they change teaching and learning in higher education? An overview. *Academic Teaching*, 4, 40-64 (Hebrew). <http://academicteaching.net/>

<sup>6</sup> Book of Amos, Chapter 3

<sup>7</sup> Salomon, G. (2001). Technology and education in the age of information. Zmora-Bitan (Hebrew).

<sup>8</sup> Like a Creative professional in a TV production.

<sup>9</sup> Experiments and demonstrations in class require expensive equipment, more staff, and preparations that sometimes take up class time. Also, not all experiments can be conducted in a classroom.

<sup>10</sup> The website of Tel Aviv University's Center for Innovative Learning: <https://tauonline.tau.ac.il/>

<sup>11</sup> In-Video Questions

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<sup>12</sup>The field of Personalized Learning has grown considerably in recent years, and now includes a whole range of tools from the disciplines of analytics, artificial intelligence (AI), big data and more.

<sup>13</sup> The institutions must establish a support system that will encourage lecturers to experiment, while helping them implement pedagogical ideas in class via digital tools.

<sup>14</sup> Adizes, I. (2000). *Managing growth and renewal of the organization*. Tel Aviv. Published by The Israeli Center of Management (Hebrew).

This model presents four different functions of the teacher as a leader.

<sup>15</sup> Expanding the production-possibility curve – an expression taken from economics, meaning an expansion of the economy's output. In our case it means the expansion of pedagogical output in the classroom.

<sup>16</sup> EdX and Arizona State University created a Global Freshman Academy program [Global Freshman Year](#).

<sup>17</sup> [Institute-wide Task Force on the Future of MIT Education Final Report, July 2014](#).

### **Additional sources**

Kolowich, S. (2013, August 08). The MOOC 'Revolution' may not be as disruptive as some had imagined. Retrieved from The Chronicle of Higher Education. <http://www.chronicle.com/article/MOOCs-May-Not-Be-So-Disruptive/140965/>

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