New Aspects of EM Education: Technology vs Books

Terrence Mulligan DO, MPH

FACEP, FAAEM, FACOEP, FIFEM, FNVSHA, FFSEM, HPF

Clinical Professor, Department of Emergency Medicine
University of Maryland School of Medicine, Baltimore, Maryland USA
Affiliate Faculty, Institute for Global Health
Visiting Professor, Hunan Peoples Hospital, China & Apollo Gleneagles Hospital, India, and Stellenbosch University, South Africa

Secretary, International Federation for Emergency Medicine
Board Member, American Academy of Emergency Medicine
President, International Federation for Emergency Medicine Institute
Treasurer, International Federation for Emergency Medicine Foundation
Vice President, American Academy of Emergency Medicine for India
Past Board Member, African Federation for Emergency Medicine
Executive Editor, *Emergency Physicians International*

UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE
Department of Emergency Medicine

UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE
INSTITUTE FOR GLOBAL HEALTH

Advances in Global EM Education: *FOAM and Flipping the Classroom*

Terrence Mulligan DO, MPH

FACEP, FAAEM, FACOEP, FIFEM, FNVSHA, FFSEM, HPF

Clinical Professor, Department of Emergency Medicine
University of Maryland School of Medicine, Baltimore, Maryland USA
Affiliate Faculty, Institute for Global Health
Visiting Professor, Hunan Peoples Hospital, China & Apollo Gleneagles Hospital, India, and Stellenbosch University, South Africa

Secretary, International Federation for Emergency Medicine
Board Member, American Academy of Emergency Medicine
President, International Federation for Emergency Medicine Institute
Treasurer, International Federation for Emergency Medicine Foundation
Vice President, American Academy of Emergency Medicine for India
Past Board Member, African Federation for Emergency Medicine
Executive Editor, *Emergency Physicians International*

UNIVERSITY *of* MARYLAND
SCHOOL OF MEDICINE
Department of Emergency Medicine

UNIVERSITY *of* MARYLAND
SCHOOL OF MEDICINE
INSTITUTE FOR GLOBAL HEALTH

FOAM and Flipping the Classroom

Terrence Mulligan DO, MPH

FACEP, FAAEM, FACOEP, FIFEM, FNVSHA, FFSEM, HPF

Clinical Professor, Department of Emergency Medicine
University of Maryland School of Medicine, Baltimore, Maryland USA
Affiliate Faculty, Institute for Global Health
Visiting Professor, Hunan Peoples Hospital, China & Apollo Gleneagles Hospital, India, and Stellenbosch University, South Africa

Secretary, International Federation for Emergency Medicine
Board Member, American Academy of Emergency Medicine
President, International Federation for Emergency Medicine Institute
Treasurer, International Federation for Emergency Medicine Foundation
Vice President, American Academy of Emergency Medicine for India
Past Board Member, African Federation for Emergency Medicine
Executive Editor, *Emergency Physicians International*

UNIVERSITY *of* MARYLAND
SCHOOL OF MEDICINE
Department of Emergency Medicine

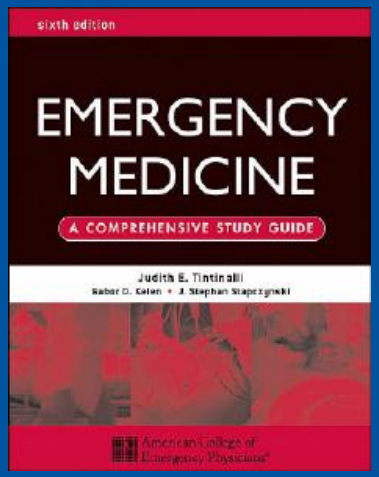
UNIVERSITY *of* MARYLAND
SCHOOL OF MEDICINE
INSTITUTE FOR GLOBAL HEALTH

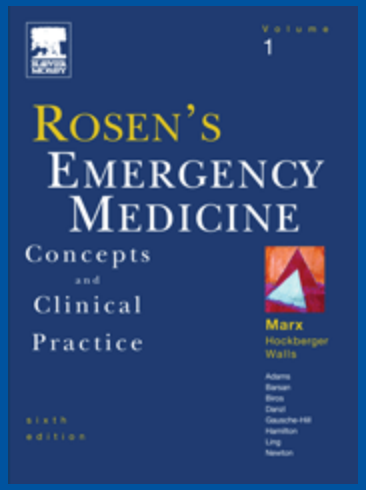
I HAVE NOTHING TO DISCLOSE

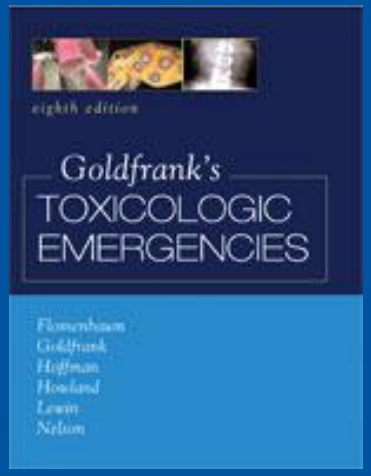
terrymulligan@yahoo.com
@tmullligan

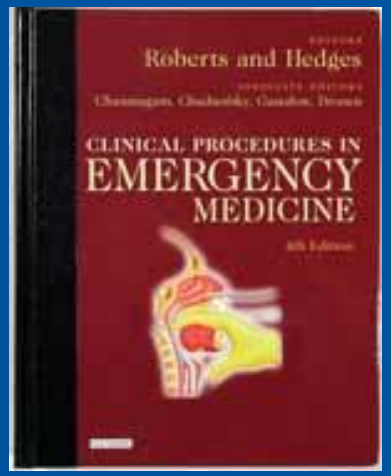
terrymulligan@yahoo.com
@tmullligan

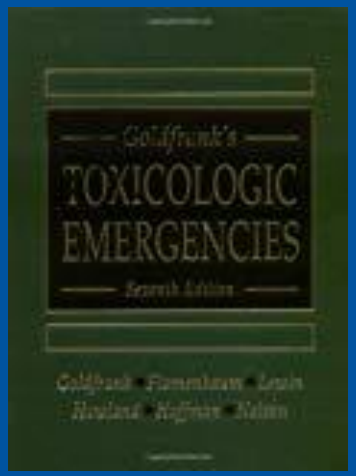
What is Emergency Medicine?

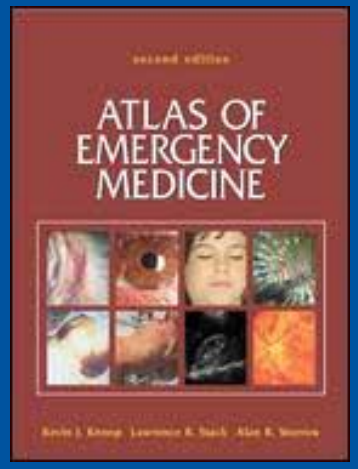


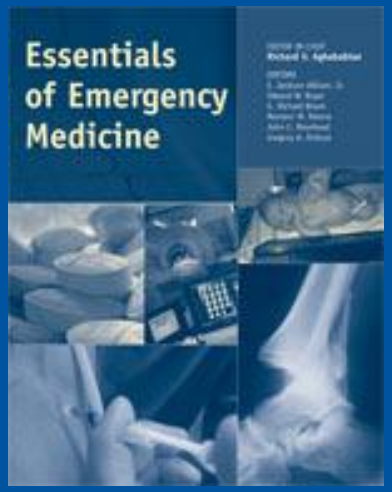




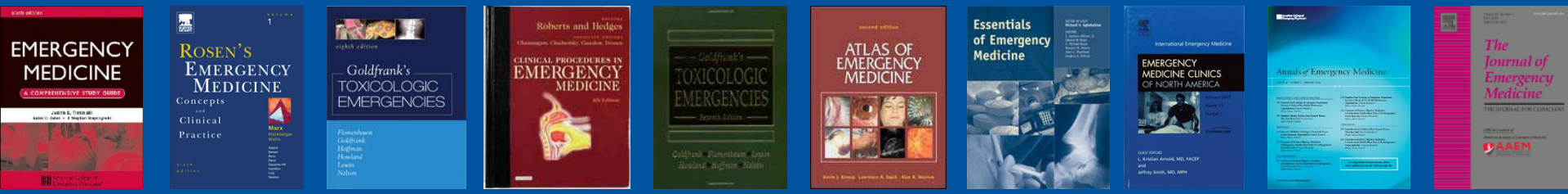








What else is Emergency Medicine?



+

HOW IS THE ED DIFFERENT FROM THE REST OF THE HOSPITAL?

ENVIRONMENT

- Frequently at / over capacity
- Door is open at both ends
- 24/7 in a 9-5 building
- Patients of all types
- Highest decision density in all of medicine
- Poor / non-existent design
- "ergonomic nightmare"

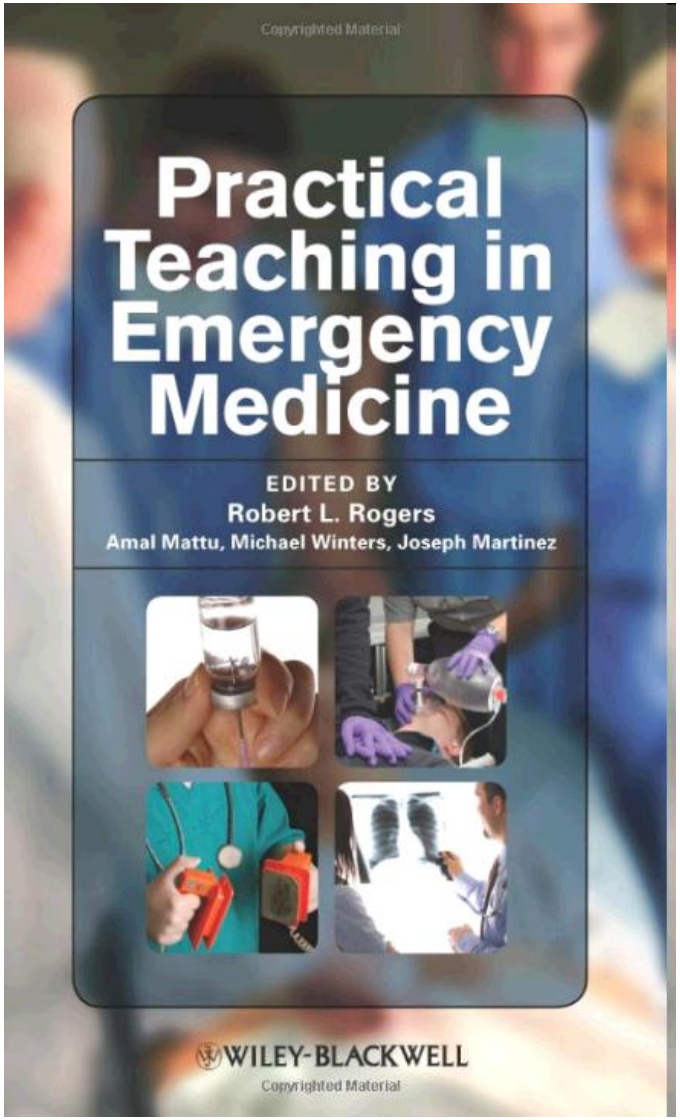
PATIENT POOL

- High acuity
  - 30% urgent/emergent
  - 1/3 admitted
- Unscheduled
- Undifferentiated
- Undiagnosed
- High patient expectations
- "ED as patient safety net"

PARADIGM / PHILOSOPHY

- Teamwork works better
- Multi-disciplinary
- Assume high acuity for all
- Treat first what kills first
- Zebras not horses
- High diagnostic pressure
- "natural experiment for the study of error"

Textbooks in EM teaching principles



<u>Practical Teaching in Emergency Medicine</u>, 2009

Robert Rogers, Amal Mattu, Michael Winters, Joseph Martinez, Terrence Mulligan

University of Maryland

“how to incorporate effective teaching strategies into the unique teaching atmosphere of the emergency department”

Copyrighted Material

Practical Teaching in Emergency Medicine

EDITED BY
Robert L. Rogers
Amal Mattu, Michael Winters, Joseph Martinez

WILEY-BLACKWELL

Copyrighted Material

Practical Teaching in Emergency Medicine

EDITED BY

Robert L. Rogers

Amal Mattu, Michael E. Winters,

Joseph P. Martinez & Terrence M. Mulligan

SECOND EDITION

WILEY-BLACKWELL

Copyrighted material

FOAMed

https://litfl.com/foam-free-open-access-medical-education/

FOAMed

FOAMed

- FOAM = free open access medical education
  - an online movement taking place across social media, blogs, and podcasts that is challenging traditional methods of medical education

FOAMed

- Coined in 2012, FOAM represents more than just the content of the learning resources

- it is considered to be an ethos,
  - a dedication to the learning and teaching of medicine in a collaborative environment made easily accessible by online platforms.

FOAMed

- 97.7 percent of American medical residents are spending at least one hour per week supplementing their traditional academic curricula with podcasts

- This rapid expansion and increasing influence of FOAM in emergency medicine suggests a need for further analysis

FOAMed

FOAMed

LIFE IN THE FASTLANE

ALiEM Academic Life in Emergency Medicine

ST.EMLYN'S
EMERGENCY MEDICINE #FOAMED

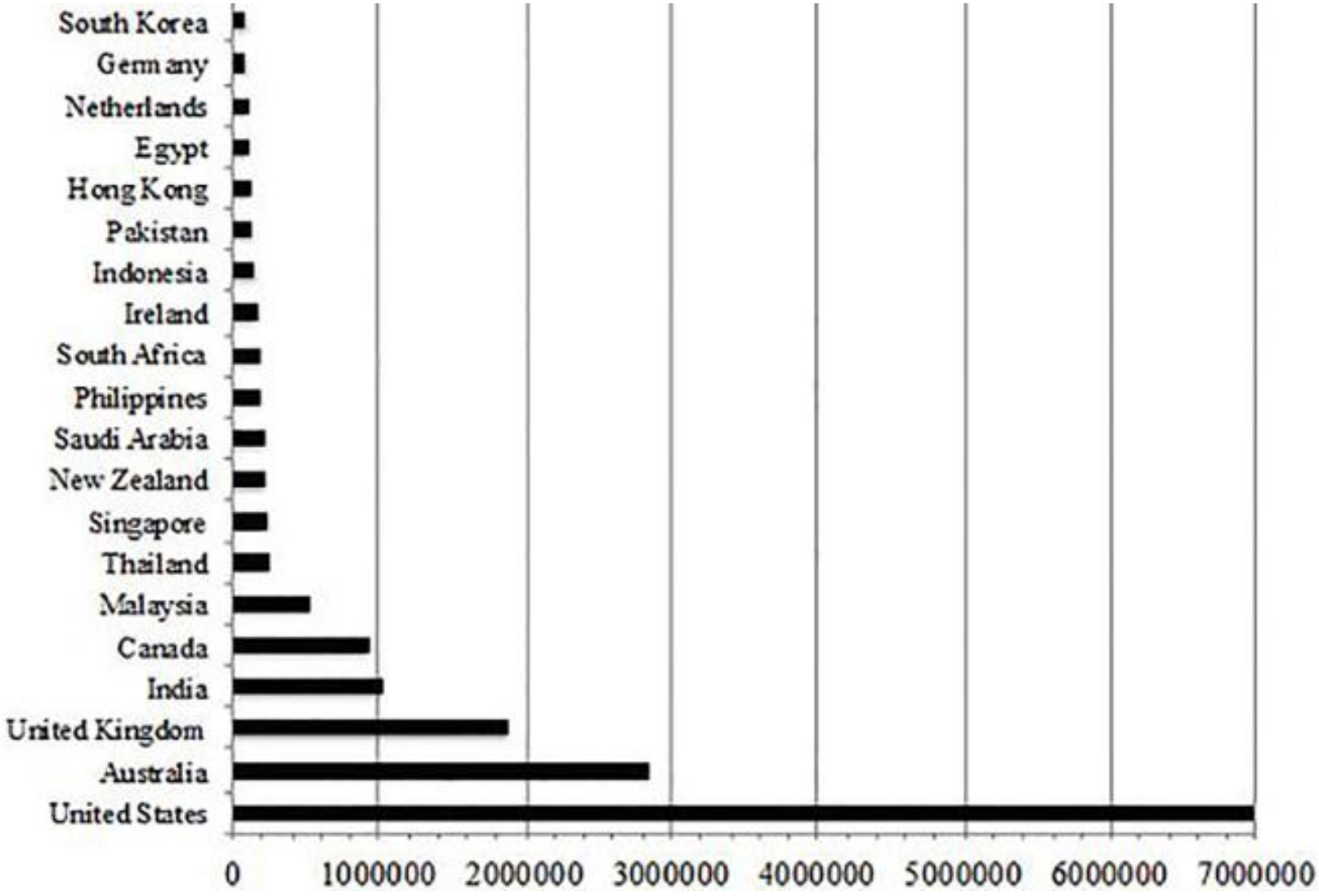
emDocs

REBELEM

EMCrit Project

Click for More Subscribe Options

FOAMed


South Korea
Germany
Netherlands
Egypt
Hong Kong
Pakistan
Indonesia
Ireland
South Africa
Philippines
Saudi Arabia
New Zealand
Singapore
Thailand
Malaysia
Canada
India
United Kingdom
Australia
United States
0
1000000
2000000
3000000
4000000
5000000
6000000
7000000

FOAMed

Gross Session Count
<1,000
1,000 – 9,999
10,000 – 99,999
100,000 – 999,999
>1,000,000

FOAMed

Distribution of FOAM sessions by World Bank income level, 2016.

Income level*	Total sessions	% of Total sessions	Sessions per million people	% of Sessions per million people
High-income	14,067,663	75.30%	806,043	73.72%
Upper-middle income	1,604,520	8.59%	190,835	17.45%
Lower-middle income	2,933,755	15.70%	93,350	8.54%
Low-income	77,229	0.41%	3,219	0.29%

General Goals of Teaching

- Change behavior (for the better)
- Be an enjoyable experience
- Foster desire for life-long learning

Remember that good teaching requires work and effort by the faculty and not just by the students !

Overall goal of teaching in EM

Goal is to produce physicians who can:

- evaluate and stabilize every type of ED patient
- advocate for appropriate aftercare
  - expert at practice ecology
- rise to leadership in local, regional, national institutions
- perform research; publish

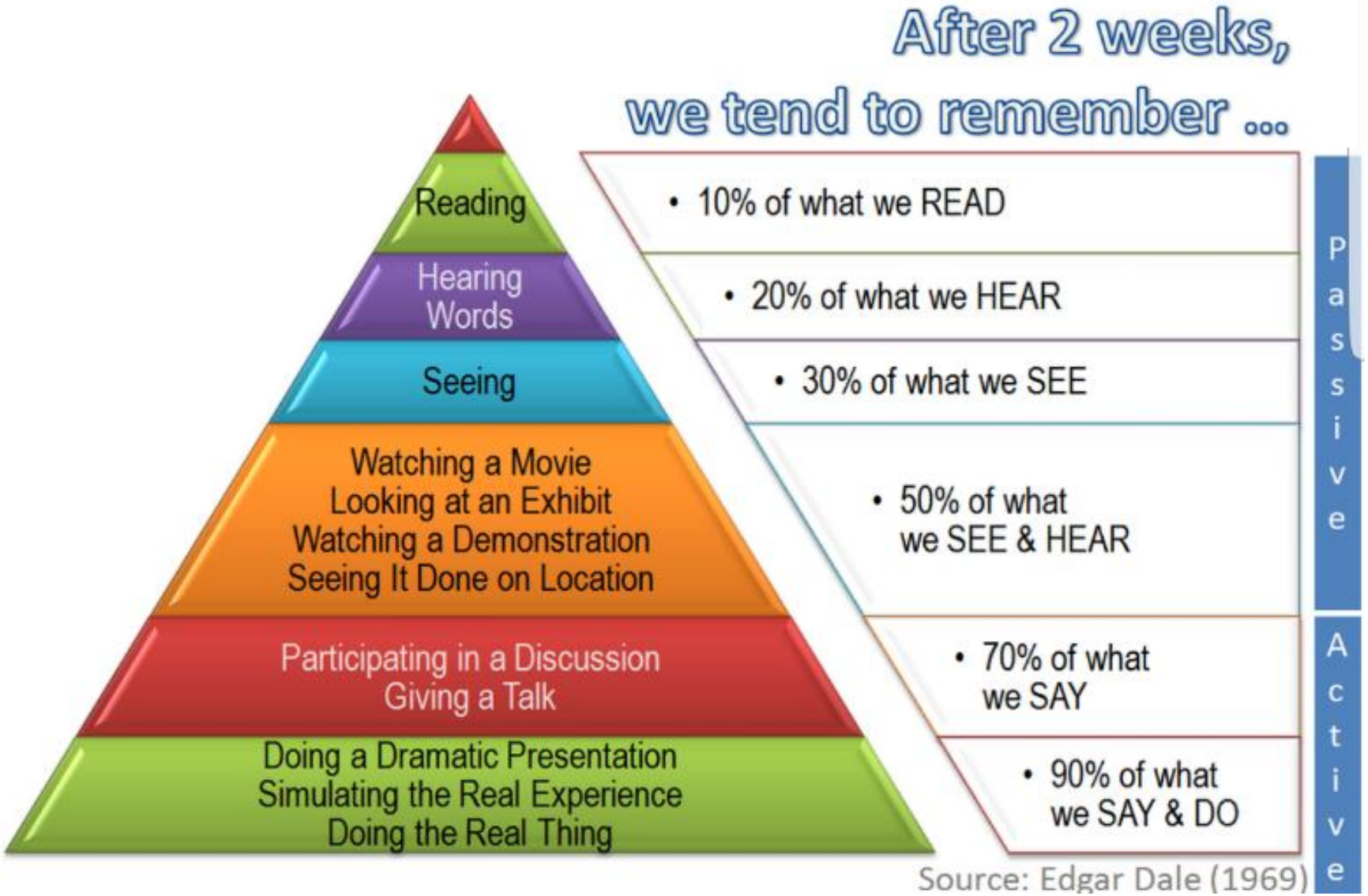
Typical method of teaching

- Teacher + classroom method
  - Passive in-class lecture
  - 20-60 minutes / lecture
  - Hours of lecture per day
- Students sitting in classroom listening
  - Listening (and taking notes)
  - Hearing?
  - Learning?
- Students then given homework to complete

The Cone of Learning

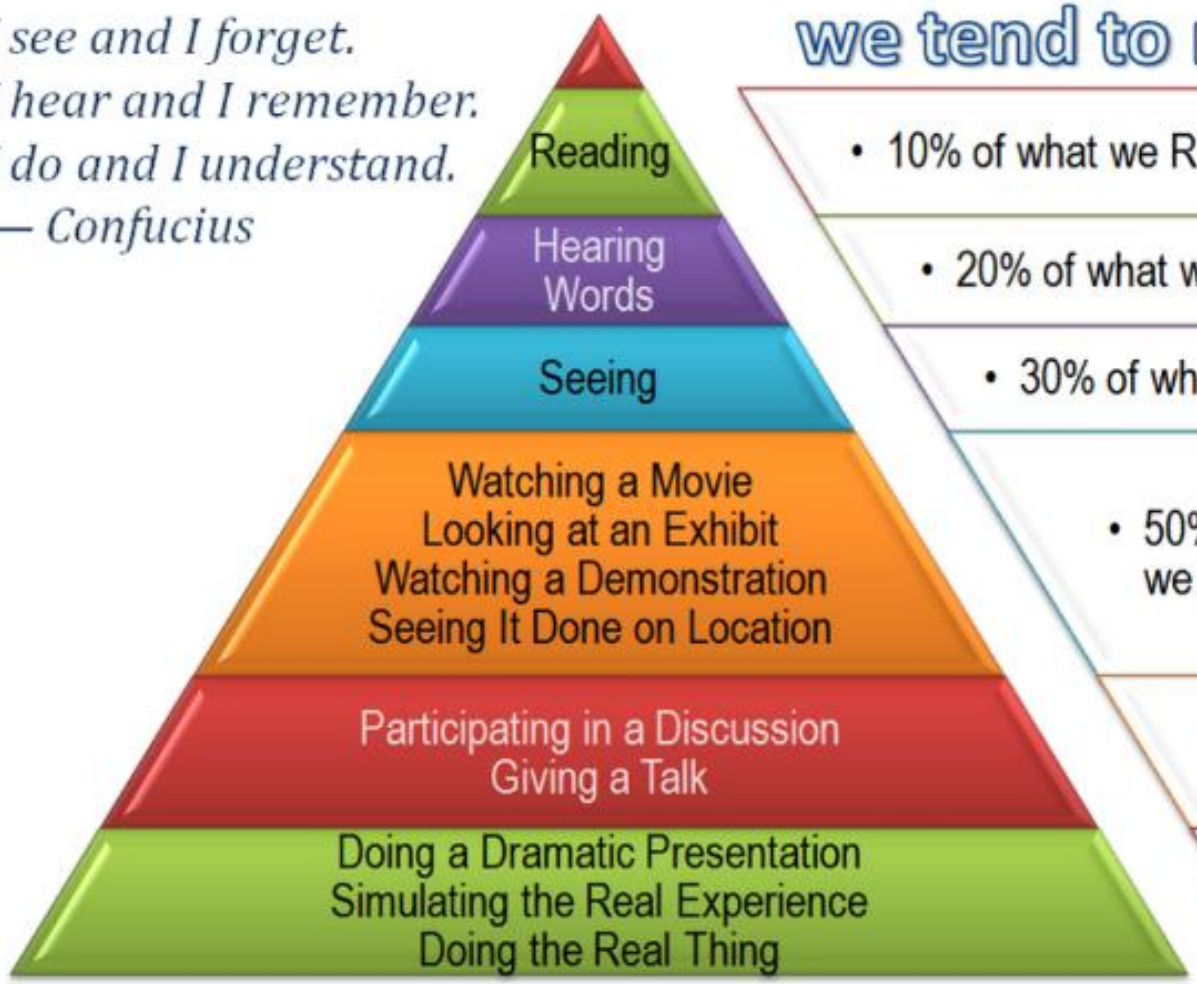
The Cone of Learning

The Cone of Learning



The Cone of Learning

I see and I forget.
I hear and I remember.
I do and I understand.
— Confucius



After 2 weeks, we tend to remember ...

- 10% of what we READ
- 20% of what we HEAR
- 30% of what we SEE
- 50% of what we SEE & HEAR
- 70% of what we SAY
- 90% of what we SAY & DO

Passive

Active

Source: Edgar Dale (1969)

Problems with the Typical method of teaching

- Students learn at different rates
  - Some are bored
  - Some are confused
- Attention spans wane very quickly
  - 15-20 minutes even with the best of lecturers
- Limited questions/answers and discussion
  - Classroom time is taken up by lectures
  - Homework is discussed only briefly

Problems with homework

- Done at home, often with no helpers

- This results in
  - boredom
  - Frustration
  - Exhaustion

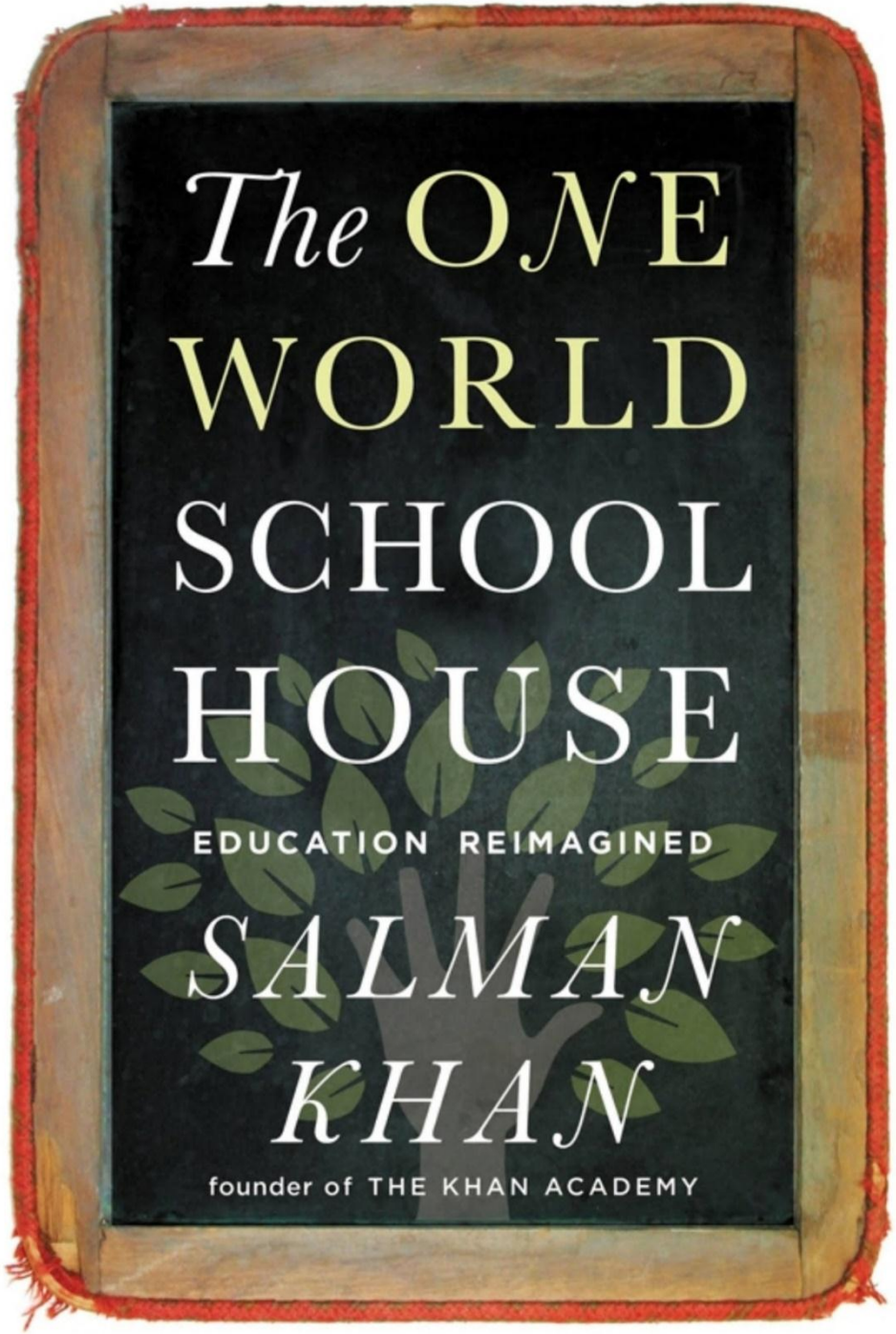
Problems with homework

- The exact nature of of unanswered questions / difficulties with homework are forgotten by the time class reoccurs

- When in class, students get limited feedback on how well they are doing
  - Classroom is for lectures
  - The teacher has to move to the next topic…
  - Students are left behind (or bored)

The result of the typical passive, in-class lecture method

- Struggling students are left behind…
- Fast students are bored…
- Feedback is not gotten until testing occurs later…
- Testing shows past performance but is a poor method of teaching…
- After testing, the teacher must move on to the next topic…
- LEAVING MOST STUDENTS WITH DISSERVICE


The ONE WORLD SCHOOL HOUSE
EDUCATION REIMAGINED
SALMAN KHAN
founder of THE KHAN ACADEMY

THE FLIPPED CLASSROOM

Turning Traditional Education on Its Head

Many educators are experimenting with the idea of a flipped classroom model. So what is it and why is everyone talking about it?

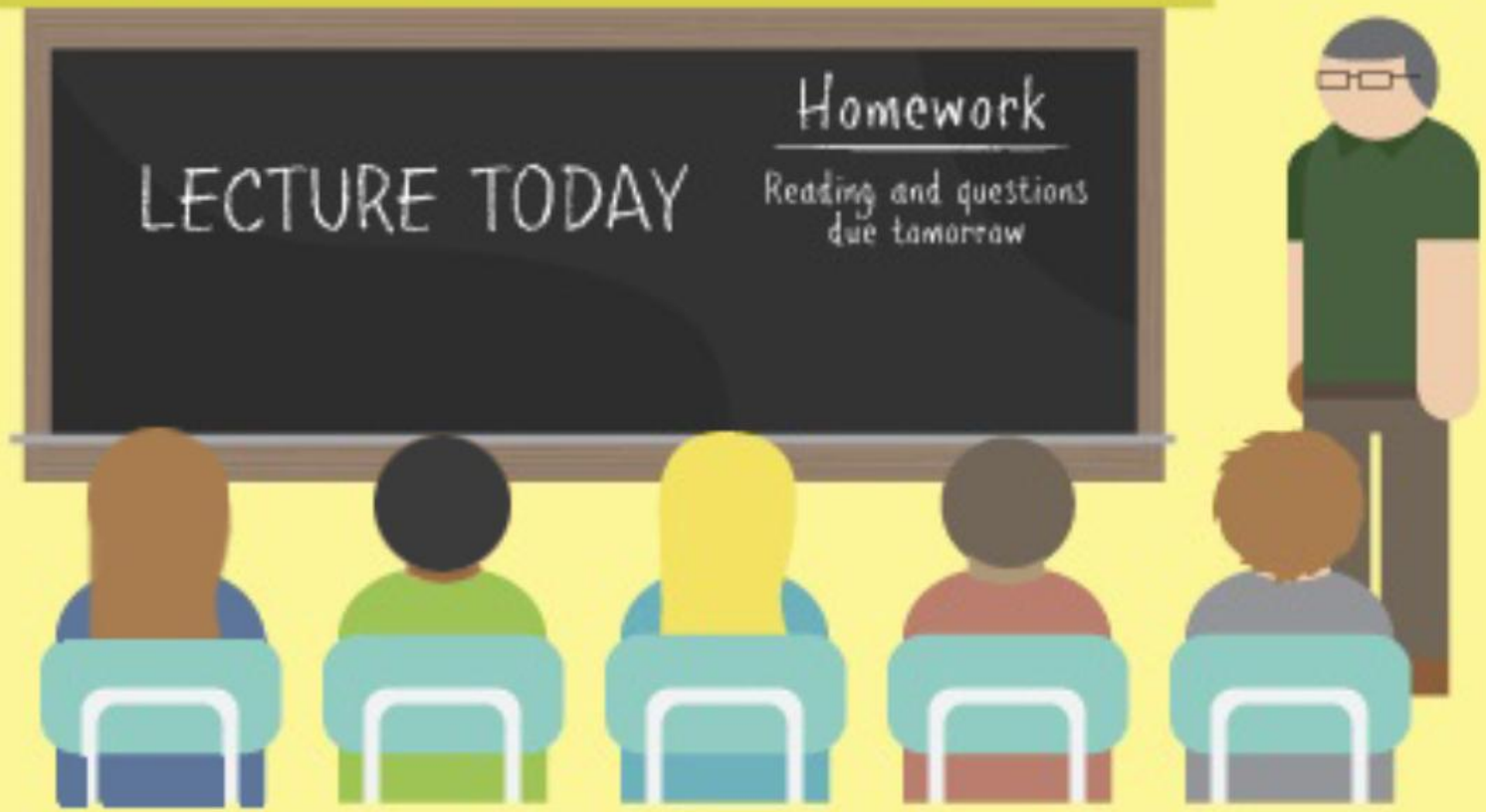
WHAT IS THE FLIPPED CLASSROOM?

The flipped classroom inverts traditional teaching methods, delivering instruction online outside of class and moving "homework" into the classroom.

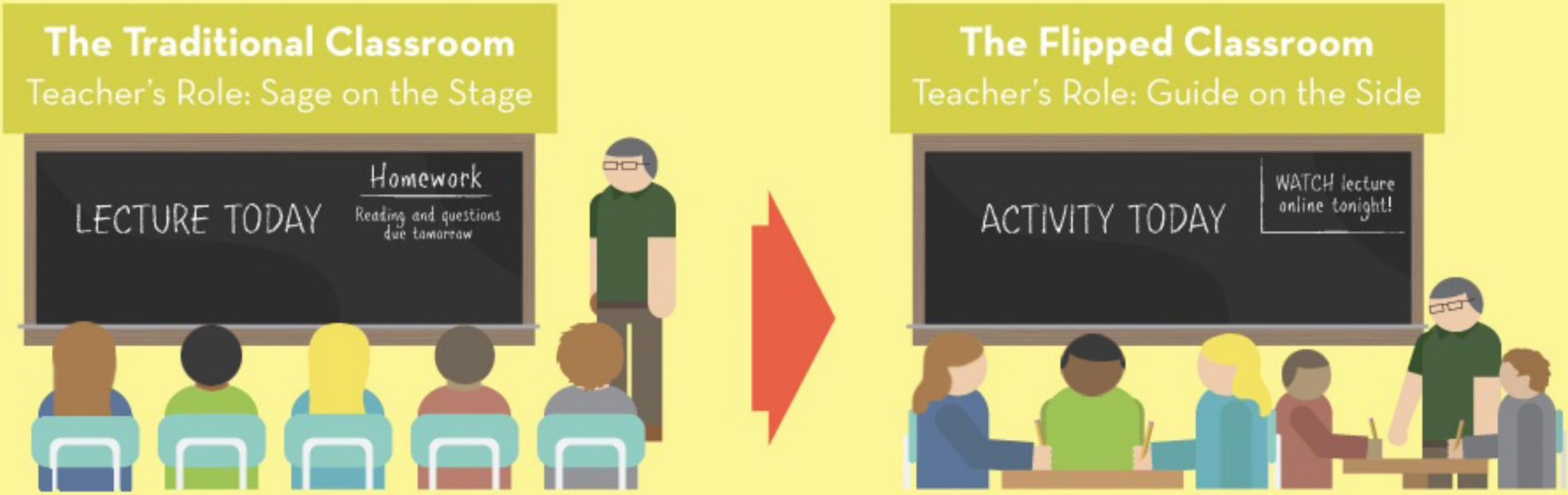
THE INVERSION

The Traditional Classroom

Teacher's Role: Sage on the Stage



THE INVERSION

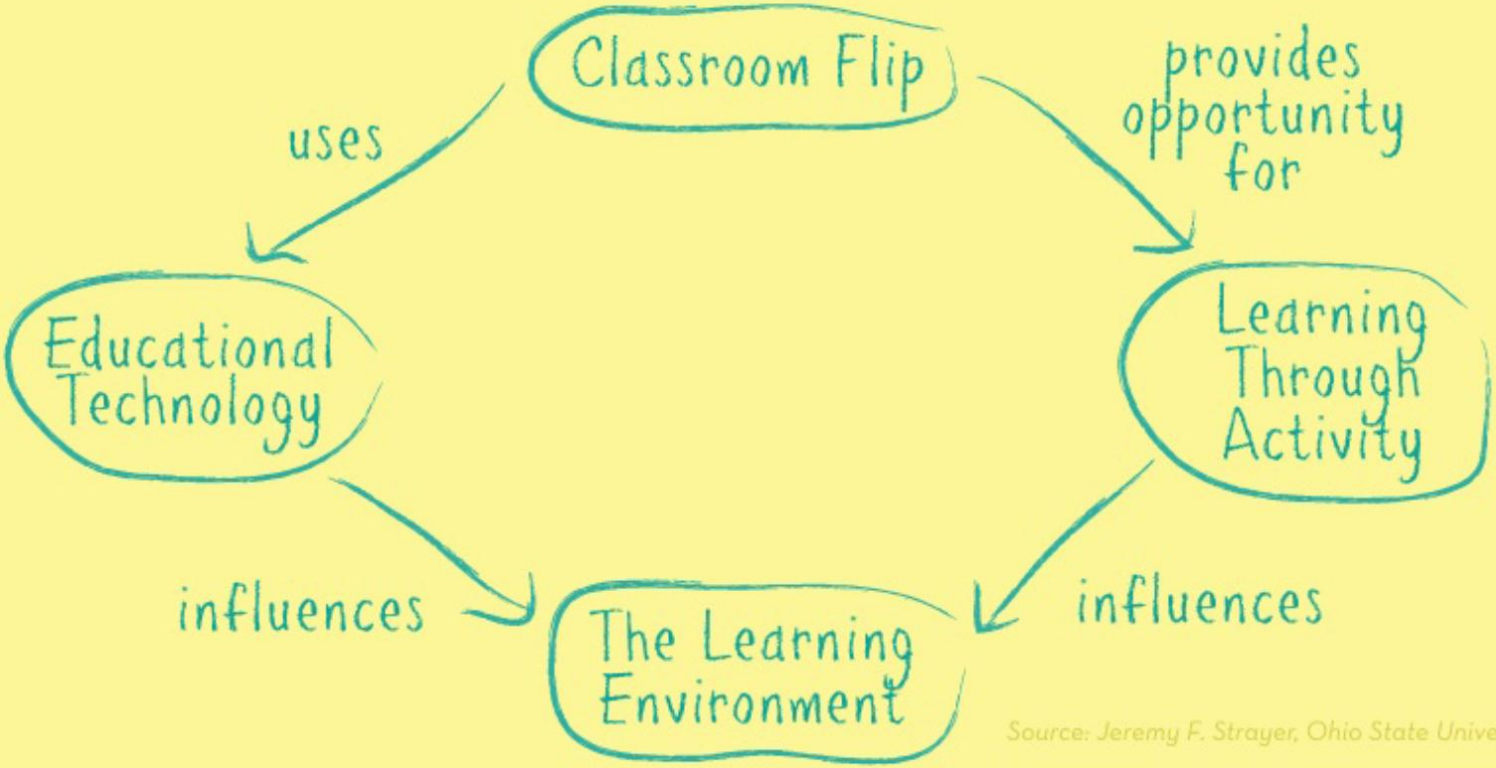


WHAT A FLIPPED CLASSROOM MODEL DOES

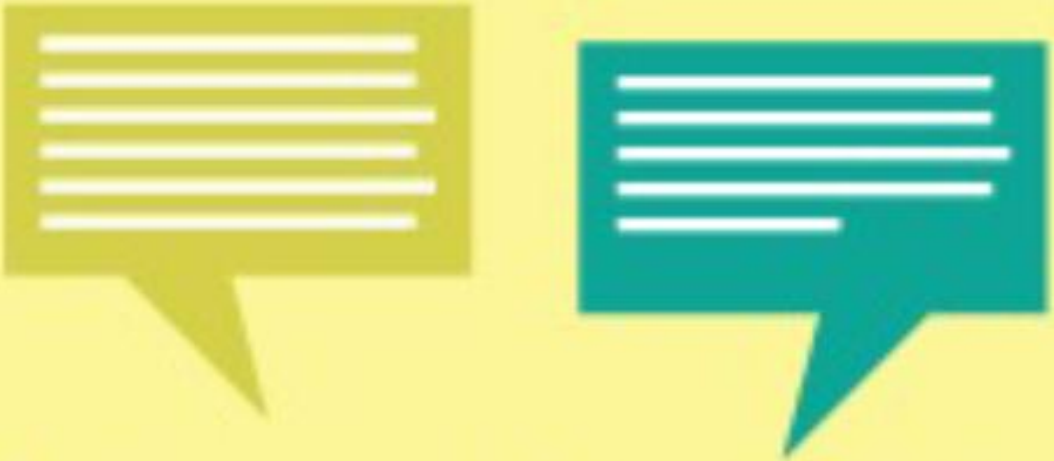
- Students watch lectures at home at their own pace, communicating with peers and teachers via online discussions.
- Concept engagement takes place in the classroom with the help of the instructor.

A THEORETICAL FRAMEWORK

Educational technology and activity learning are two key components of the flipped classroom model. They both influence student learning environments in fundamental ways.

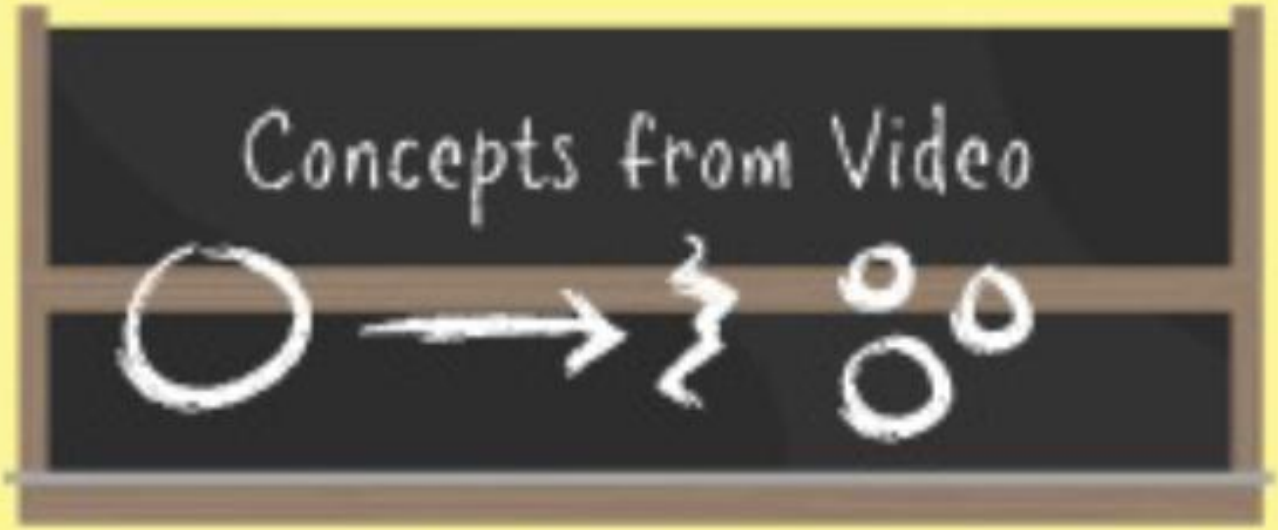


Source: Jeremy F. Strayer, Ohio State University



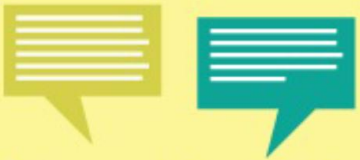
Students receive instant feedback. Teachers have more time to help students and explain difficult concepts.

Students don't get as frustrated. Before, many students wouldn't complete homework if they got frustrated with it. Working on problems in class minimizes this problem.

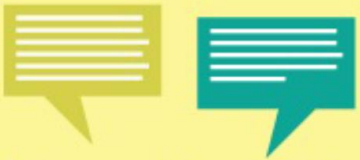


Teachers revisit concepts students don't understand. After students watch lessons, they write down any questions they have. Teachers review those questions with students individually.

Teachers support students in class. Students who might not have technology or parents to help them outside of school now have teachers guiding them in class.

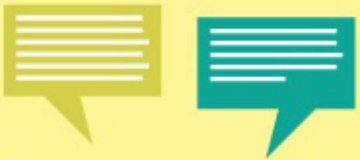


Students receive instant feedback.
Teachers have more time to help students and explain difficult concepts.



Students receive instant feedback.
Teachers have more time to help students and explain difficult concepts.

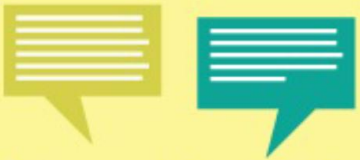
Students don't get as frustrated.
Before, many students wouldn't complete homework if they got frustrated with it. Working on problems in class minimizes this problem.



Students receive instant feedback. Teachers have more time to help students and explain difficult concepts.

Students don't get as frustrated. Before, many students wouldn't complete homework if they got frustrated with it. Working on problems in class minimizes this problem.

Teachers revisit concepts students don't understand. After students watch lessons, they write down any questions they have. Teachers review those questions with students individually.



Students receive instant feedback. Teachers have more time to help students and explain difficult concepts.

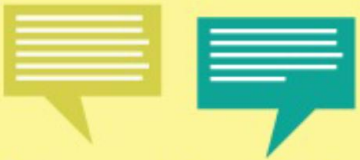
Students don't get as frustrated. Before, many students wouldn't complete homework if they got frustrated with it. Working on problems in class minimizes this problem.

Teachers revisit concepts students don't understand. After students watch lessons, they write down any questions they have. Teachers review those questions with students individually.

Teachers support students in class. Students who might not have technology or parents to help them outside of school now have teachers guiding them in class.

"It's about changing instructional models so the students can receive more instructional support in the classroom from the experts that Clintondale has on staff."

– Bruce Umpstead, Michigan Office of Education Technology & Data Coordination



Students receive instant feedback. Teachers have more time to help students and explain difficult concepts.

Students don't get as frustrated. Before, many students wouldn't complete homework if they got frustrated with it. Working on problems in class minimizes this problem.

Teachers revisit concepts students don't understand. After students watch lessons, they write down any questions they have. Teachers review those questions with students individually.

Teachers support students in class. Students who might not have technology or parents to help them outside of school now have teachers guiding them in class.

"It's about changing instructional models so the students can receive more instructional support in the classroom from the experts that Clintondale has on staff."

– Bruce Umpstead, Michigan Office of Education Technology & Data Coordination

THE RESULTS

THE RESULTS

BEFORE THE FLIP

+50%
of freshmen failed English

44%
of freshmen failed math

736 discipline cases in one semester

THE RESULTS

BEFORE THE FLIP

+50% of freshmen failed English

44% of freshmen failed math

736 discipline cases in one semester

AFTER THE FLIP

19% of freshmen failed English

13% of freshmen failed math

249 discipline cases in one semester

THE RESULTS

BEFORE THE FLIP

+50%
of freshmen failed English

44%
of freshmen failed math

736 discipline cases in one semester

AFTER THE FLIP

19%
of freshmen failed English

13%
of freshmen failed math

249 discipline cases in one semester

Sources: Jeremy F. Strayer, Ohio State University | Flipped Class Conference 2011 | Telegraph.co.uk | Blendedclassroom.blogspot.com | Khan Academy | Education Week | Converge Magazine

KNEWTON

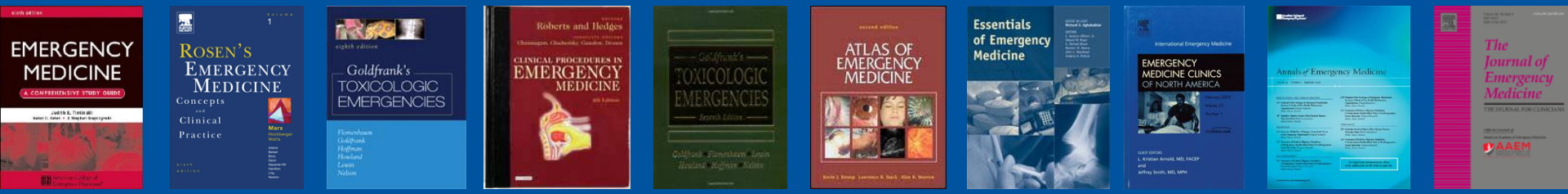
Pros of The Flipped Classroom

- Students have more control
- It promotes student-centered learning and collaboration
- Lessons and content are more accessible
  - Provided there is tech access
- Assess = easier for parents / others to monitor what's being taught
- It can be more efficient
  - More free time, more academic time

Cons of The Flipped Classroom

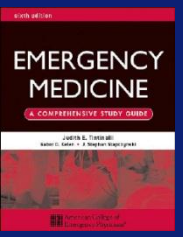
- It can create or exacerbate a digital divide
- It relies on preparation and trust
- There is significant work on the front-end
- Not naturally best for test-prep learning
- Time in front of screens – instead of people and places – is increased

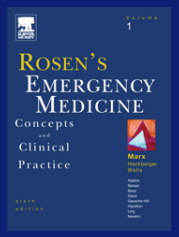
What else is Emergency Medicine?

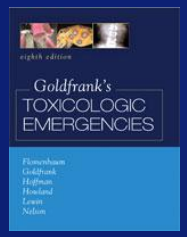


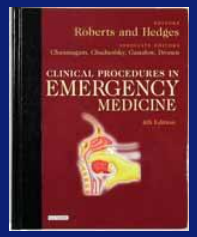
+

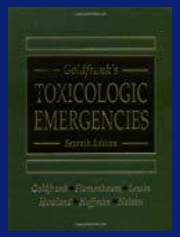
EM Education must include
TRADITIONAL
and
NEW TECHNOLOGIES

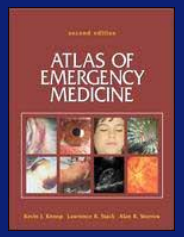


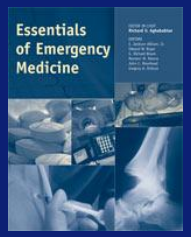


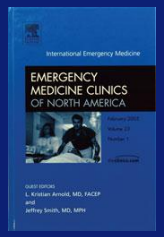












+

FOAM

Summary:

Flipping the Classroom and Integrating Education in EM

- EM education is the most important step in national EM development
  - But not the only step
- ED teaching is clinical + academic + didactic
- Flipping the Classroom allows for greater teacher-student interaction
- There is great potential for more international collaboration on EM educational projects

terrymulligan@yahoo.com
@tmullligan

INTERNATIONAL FEDERATION FOR
IFEM
EMERGENCY MEDICINE

International Federation for

IFEM FOUNDATION

Emergency Medicine Foundation

INTERNATIONAL FEDERATION FOR
IFEM INSTITUTE
EMERGENCY MEDICINE

INTERNATIONAL FEDERATION FOR

IFEM INSTITUTE

EMERGENCY MEDICINE

In collaboration with

Deloitte.

The IFEM Institute

- A not-for-profit corporation
- Separate from IFEM with philosophical and political allegiance to IFEM
- Collaborating with Deloitte to approach large-scale projects previously unobtainable or unfeasible

Why has IFEM formed a relationship with Deloitte?

Aligned to the same vision for emergency medicine, IFEM and Deloitte have formed a global relationship that combines the strengths of both organizations to not only deliver the best in emergency medicine eminence and education, but expertise in health technology, supply chain, health system financing and project management.

Deloitte.

IFEM Institute

What service offerings does the IFEM Institute provide?

QUALITY IMPROVEMENT AND PERFORMANCE

POLICY AGENDAS

EM FINANCING AND ECONOMIC STABILITY

EM SYSTEMS DEVELOPMENT

ANALYTICS AND BENCHMARKING

RESEARCH

LEARNING

IFEM Institute

How do I contact the IFEM Institute?

Find us on social media

IFEM Institute Key Contacts:

Prof. Dr. Terry Mulligan terrymulligan@yahoo.com
Prof. Dr. Lee Wallis lee@dunstone.ca.za
Prof. Dr. James Ducharme paindoc22000@yahoo.com

Summary:

Flipping the Classroom and Integrating Education in EM

- EM education is the most important step in national EM development
  - But not the only step
- ED teaching is clinical + academic + didactic
- Flipping the Classroom allows for greater teacher-student interaction
- There is great potential for more international collaboration on EM educational projects

terrymulligan@yahoo.com
@tmullligan