20. aug. 2020

MAT100 2019:

Målsetting, verdigrunnlag og motivasjon

AGENDA

- Målsetting I
- Verdigrunnlag
- Hvorfor
  - Hvorfor omvendt undervisning?
  - Hvorfor oppmøteplikt?
  - Hvorfor så arbeidskrav?

MÅLSETTING

Hva din viktigste målsetting med faget?

VERDIGRUNNLAG

Verdigrunnlag:

Er det OK å komme 10 minutter for seint til øvingsdagen?

NEI

Verdigrunnlag:

Er det OK å å komme uforbredt til øvingsdagene, uten å ha sett ukens videoer og uten å ha sett intro-videoen?

NEI

Verdigrunnlag:

Er det OK å sjekke Snapchat på mobiltelefonen mens vi har øvingetime?

NEI

Verdigrunnlag:

Er det OK å ikke se på løsingsforslag 3 dager før Den 4-ukers innleveringsfristen?

NEI

Løsningsforslaget skal sikre 75% rett og er en GOD repetisjon av fagstoffet

Verdigrunnlag:

Hva slags verdier vil dere studenter at vi skal ha i MAT100 2020?

HVORFOR?

Hvorfor har vi valgt formatet «omvendt undervisning»?

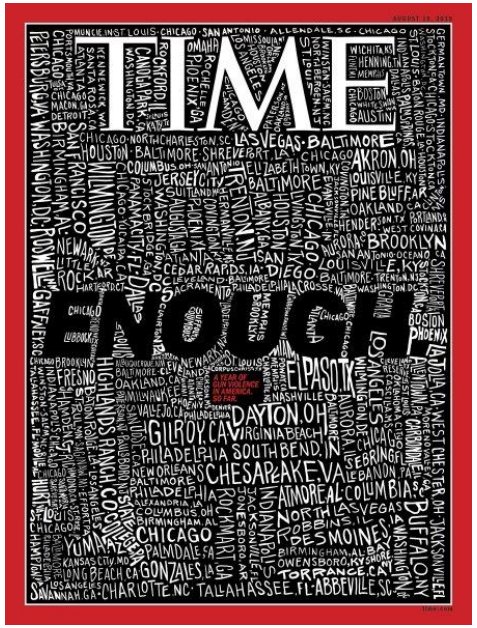
1) HVORFOR: har vi valgt å bruke omvendt undervisning?

2) HVORFOR: har vi obligatorisk oppmøte på øvingsdagene?

3) HVORFOR: Hvorfor har vi hele 75% rett for å få godkjent?

1) HVORFOR: har vi valgt å bruke omvendt undervisning?

TID! Vi verdsetter DIN tid!



1. Mindre tid til passiv læring (forelesning/video)
2. Mer tid til aktiv læring (øvinger/gruppearbeid)

Vitenskapelig forankring 1

«Sammenligning av effektivitet av omvendt undervisning med tradisjonell undervisning i et master ingeniørkurs»

Comparing the Effectiveness of an Inverted Classroom to a Traditional Classroom in an Upper-Division Engineering Course

Gregory S. Mason, Teodora Rutar Shuman, and Kathleen E. Cook

Abstract—**An inverted, or flipped, classroom, where content delivery includes video lectures watched outside of the classroom, is a method that can free classroom time for learner-centered activities such as active and problem-based learning. This study compared the effectiveness of an inverted classroom to a traditional classroom in three areas: 1) content coverage; 2) student performance on traditional quizzes and exam problems; and 3) student observations and perception of the inverted classroom format. A control-treatment experiment comparing an inverted classroom to a traditional lecture-style format was used. The results show that: 1) the inverted classroom allowed the instructor to cover more material; 2) students participating in the inverted classroom performed as well or better on comparable quiz and exam questions and on open-ended design problems; and 3) while students initially struggled with the new format, they adapted quickly and found the inverted classroom format to be satisfactory and effective.**

Index Terms—**Active learning, control systems, education, flipped classroom, inverted classroom, problem-solving, semi-supervised learning.**

I. Introduction

THE PRESSING need to reengineer engineering education has been established in the past decade [1]–[4]. Yet, engineering education today is still largely using outdated approaches for teaching technical concepts and problem solving [5]. Developing skills that are conducive to professional success is a key factor behind the emerging shift away from a traditional lecture–example–homework format to more applied, learner-centered classroom [6]–[11]. The learner-centered classroom, however, imposes difficulty for educators because they need to make time for methods such as active and problem-based learning while still meeting the heavy content demands of engineering courses [12], [13]. One promising approach is to deliver the course content using an inverted (i.e., flipped) classroom and so free class time for active and problem-based learning [14]–[16].

In an inverted classroom (IC), course content is disseminated outside the classroom through traditional formats such as assigned reading and homework problems and through new formats such as video lectures, PowerPoint presentations, and Web-based tutorials. The IC has been enabled by the advent of digital video recording, digital media, and interactive Web pages. These resources allow instructors to capture and publish course content online where they are easily accessible to students outside of class time. Unlike an online class, an IC includes face-to-face time with the instructor in a classroom or laboratory setting where the material learned outside of class is discussed and applied.

There are three primary motivations for using an IC. First, the IC frees class time for interactive activities, such as active, cooperative, and problem-based learning, and for reinforcing course material without sacrificing content [13], [16]–[21]. Second, the IC allows an educator to present course material in several different formats, and so engage the students' various learning styles and preferences [13], [22]. Third, the IC can encourage students to become self-learners and help prepare them for how they will need to learn as practicing engineers [17].

Although there are compelling reasons to implement an IC, there are also some potential problems. First, implementing an IC can initially be time-consuming. An instructor cannot simply videotape a 50-min lecture. Zappe [13] found an optimum video length to be around 20 min, which requires the instructor to reorganize course material into short segments and to spend time editing recordings. The instructor must also develop and include activities and/or a pretest to ensure that students are prepared for class [18], [23]. Second, online learning may frustrate some students. Strayer [24] found some students were uncomfortable at having to take responsibility for their own learning. The instructor can allay this discomfort by providing clear expectations for what students should know [25]. Third, there is some discrepancy in the literature about the appropriateness of an IC for different course levels. Bland [17] was cautious about using an IC in more advanced courses, while others suggest that an IC may be more applicable in advanced courses [24], [26].

This paper reports on the results of a two-year study in an upper-division engineering course in which a traditional lecture course (TC) was used in one year and an IC was used the next. The goals of the study were the following.

1) To quantify how an IC affects classroom management—specifically content coverage. Although others [17] report that an IC allows the use of student-centered learning in the classroom without sacrificing content coverage, the results are primarily based on observation and not on a direct comparison to an identical course in a controlled setting.

Manuscript received September 16, 2012; revised December 21, 2012; accepted February 02, 2013. Date of publication March 18, 2013; date of current version October 28, 2013.

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Digital Object Identifier 10.1109/TE.2013.2249066

Resultatene fra denne artikkelen viser:

- «Omvendt undervisning tillater underviseren til å dekke mer stoff»

- «Studenter som deltar på omvendt undervisning presterte like godt eller bedre på sammenlignbare quiz og eksamensspørsmål»

- «Studenter som i starten strever med å tilpasse seg det nye formatet greide raskt å tilpasse seg og synes at omvendt undervisning er både tilfredsstillende og effektivt»



Resultatene fra denne artikkelen viser:

- «Omvendt undervisning kan spille en nøkkelrolle i moderne ingeniørutdannelse ved å frigjøre tid for læringssentrerte aktiviteter og oppfordre studenter til å bli mer uavhengige og selvlærende.»



Forelesninger: (MAT100 2018)

- 4 forelesninger per uke
- 12 uker undervisning
- 45 minutter/forelesning

- 180 minutter/uke

Tid forelesninger:

180 *12 minutter = 2160 minutter

= 36 timer

Omvendt undervisning: (MAT100 2020)

- 4-5 videoer per uke
- 5 – 25 minutter, typisk

- 100 minutter/uke

Tid video:

100*12 minutter = 1200 minutter

= 20 timer

Konklusjon:

Nesten halvering av «forelesningstid»

med omvendt undervisning!

2) Hvorfor: har vi **obligatorisk oppmøte** på øvingsdagen?

a) TID og STRESS Du slipper å utsette innleveringer og komme i stressituasjoner.

2) HVORFOR:

har vi obligatorisk oppmøte på øvingsdagen?

b) MATTE-TRENING

Vi forsikrer oss at du får den treningen matematikk krever.

2) HVORFOR:

har vi obligatorisk oppmøte på øvingsdagen?

c) EKSAMEN

Øvingene har en struktur som ligner på eksamen i MAT100 .

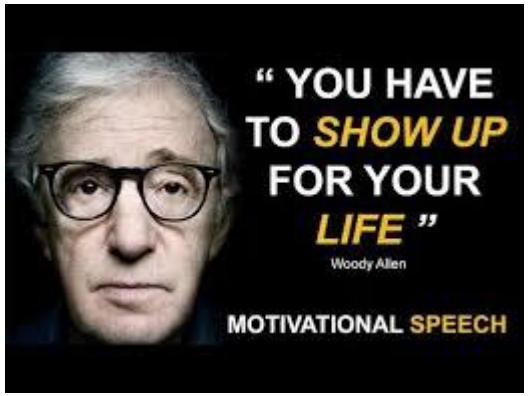
2) HVORFOR:

har vi obligatorisk oppmøte og innlevering på øvingsdagen?

d) KONKLUSJON

MØT OPP!

En sikker vei til suksses!



Vi oppfordrer til

gruppearbeid og samarbeid på

øvingsdagene

3) HVORFOR: samarbeid?

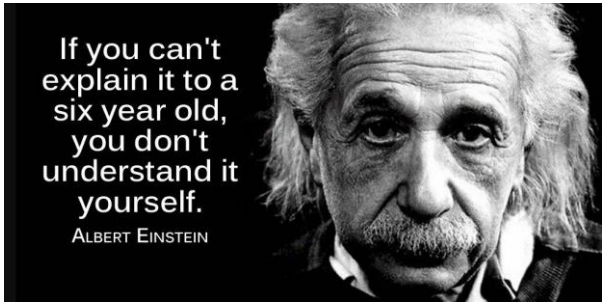
a) Gruppedel

Gjennom diskusjon i samarbeid vil du få nye vinklinger til det samme stoffet som styrker både forståelsen og hukommelsen for temaet.

3) HVORFOR: samarbeid?

b) Gruppedel

Å forklare egne tanker til medstudenter avdekker hvor godt en selv kan stoffet.



3) HVORFOR: samarbeid?

c) Gruppedel

Å kunne jobbe i team er en viktig egenskap i arbeidslivet.