Teaching for Active Learning TAL2018

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SDU

Indholdsfortegnelse

Teaching for Active Learning TAL2018 - Collaborative learning

I november 2018 afholdt SDU Universitetspædagogik (SDUUP) sin sjette **Teaching for Active Learning** konference på Syddansk Universitet (SDU). Konferencens hovedtema var aktiverende undervisning og aktiv læring, som er det bærende princip for uddannelse ved SDU. Formålet med vores årlige TAL-konference er at give undervisere, uddannelsesudviklere og andre uddannelsesinteresserede ved SDU og andre videregående uddannelsesinstitutioner mulighed for at

- dele, dokumentere, demonstrere, begrunde og analysere egne eksempler på aktiverende undervisning og aktive læring
- blive inspireret til at videreudvikle egen aktuel praksis eller udvikle en ny egen praksis inden for aktiverende undervisning og aktiv læring

TAL2018 havde særligt fokus på **Collaborative Learning**

Nikol Rummel og Anne Deiglmayr introducerede i fællesskab TAL 2018-konferencens tema gennem deres indledende og afsluttende keynotes.

Dr. Nikol Rummel er professor og leder af Educational Psychology Lab på Institute of Educational Research på Ruhr-Universität Bochum i Tyskland. Nikol er også adjungeret professor ved Human-Computer Interaction Institute ved Carnegie Mellon University, Pittsburg, USA. En af hendes primære forskningsinteresser er udvikling og evaluering af vejledning og støtte til kollaborativ læring, med fokus på computer-supported settings (CSCL) og adaptiv kollaborativ læringsstøtte.

Dr. phil. Anne Deiglmayer var på tidspunktet for TAL2018 seniorforsker indenfor Learning and Instruction, ved ETH Zürich, Schweiz, men er siden tiltrådt en professorstilling ved University of Leipzig. Anne beskæftiger sig med eksperimentel, kvantitativt orienteret forskning, som hun kombinerer med tilbundsgående analyser af interpersonel interaktion indenfor kollaborativ læring.

I deres indledende keynote 'Collaborative Learning in Higher Education – Relevant Dimensions', gav Nikol og Anne et kort overblik over fem principper forbundet med effektiv kollaborativ læring: positiv social gensidig afhængighed, individuel ansvarlighed, sociale evner, gruppeprocesser og promotiv interaktion (Johnson og Johnson, 1989). Vigtigheden af disse fem principper blev yderligere eksemplificeret, da Anne og Nikol påpegede deres forekomst i de abstracts om fælles læringspraksisser, som efterfølgende blev præsenteret på TAL2018 konferencen.
Nikol og Anne talte derefter om, hvordan vores forståelse af kollaborativ læring har udviklet sig ud over disse kerneprincipper, og hvordan forskning i computer-supported settings (CSCL) har afdækket vigtigheden af proceslister til at guide studerende igennem kollaborative læringsaktiviteter.

Nikol talte om aktuel forskning i identifikation af mere nuancerede dimensioner, og hvordan overskrifterne hvorfor, hvem, hvad og hvordan også kan være relevante for udviklingen af kollaborative læringsaktiviteter. Deltagerne i TAL2018 blev opfordret til at reflektere over disse dimensioner, når de senere på dagen skulle høre oplæg og deltage i workshops. I eftermiddagens keynote Collaborative Learning in Higher Education: Reflections and New Directions talte Anne og Nikol om deres refleksioner i forbindelse med konferencens

præsentationer, og de fremhævede hvordan eksempler på undervisningspraksis passede sammen med de fem principper og dimensioner, som er forbundet med effektiv kollaborativ læring.

De sluttede af med at give eksempler på aktuel forskning på området og pegede på mulige retninger, med fokus på den seneste udviklinger inden for computerunderstøttet kollaborativ læring.

En bedre forståelse af hvordan vi lærer i en kollaborativ sammenhæng var et væsentligt tema for konferencen. De indblik, som Anne og Nikol kom med, bidrog sammen med eksemplerne på undervisningspraksis, til at give os flere ideer og praktiske forslag til effektivt gruppearbejde og kollaborative læringsaktiviteter.

TAL2018 bød desuden på en række interessante oplæg og workshops på dansk og engelsk. I denne konferencepublikation finder du danske og engelske bidrag som deltagerne efterfølgende har produceret, tekster og video som udfolder det oprindelige bidrags pointer.

Både konferencen og denne publikation er med til at dokumentere, at der foregår meget nyskabende, velbegrundet og gennemtænkt undervisning på tværs af uddannelsesniveauer og -institutioner, og arrangørerne bag konferencen takker alle deltagerne og bidragyderne for deres medvirken til at sætte fokus på claborative learning, og på hvordan aktiverende undervisning og aktiv læring kan praktiseres.

Vi håber med denne publikation ikke alene at kunne inspirere til forsat erfaringsudveksling og videreudvikling af de mange gode praksisser inden for aktiverende undervisning og aktiv læring, men også at have givet undervisere mulighed for at dokumentere og dele deres reflekterede erfaringer med undervisning – at synliggøre, hvordan læring er blevet gjort muligt.

På vegne af konferencearrangørerne

Christopher Kjær, Donna Hurford og Lotte Dyhrberg O'Neill

Effekten af online quizzer og *think-pair-share*

Christian Højer Schjøler, adjunkt, Juridisk Institut, Syddansk Universitet

Introduktion

Undervisningen på jura-uddannelsen er kendetegnet ved et omfangsrigt pensum, der i høj grad fordrer en væsentlig grad af "udenadslære", hvilket fører til en – måske traditionsbetinget – ensidig undervisningsform med vægt på gennemgang af pensum frem for en dialogbaseret undervisningsform. Denne traditionsbaserede monotone undervisningsform harmonerer meget dårligt med nutidige universitetsstuderende, der er udfordret på koncentrationsevnen pga. "pinball-effekten".[1] Dernæst afdækker denne undervisningsform ikke de konkrete læringsbehov hos de studerende, idet den tager afsæt i et af underviseren forudsat vidensniveau hos de studerende.

For at overkomme disse mangler forsøgte jeg at anvende online quizzer, hvor de studerende deltog individuelt, som et pædagogisk værktøj og et afbræk i undervisningen for at genskabe fokus. Jeg anvendte websiden www.kahoot.it og online student response systemet "Poll Everywhere" til brug for quiz-elementet. Under brugen af disse læringsværktøjer indgik der et element af think-pair-share, idet jeg til udvalgte vanskelige quizspørgsmål, der var åbne for fortolkning, indledningsvist lod de studerende besvare spørgsmålet individuelt uden at angive det korrekte svar. Derefter lod jeg de studerende drøfte spørgsmålet/-ene i små grupper, hvorefter de besvarede spørgsmålet/-ene igen for at se, om flere angav det korrekte svar.

Hvordan anvendtes redskaberne?

Aktiviteten gennemførtes i overbygningsvalgfaget "Videregående ansættelsesret" i F2018 på cand.jur.- uddannelsen. Aktiviteten fandt sted som supplement til katederundervisning og case gennemgangen, og ofte lå den til sidst i lektionen som opsamling og afprøvning af de studerendes skete læring under lektionen.

Quiz-spørgsmålet ser f.eks. således ud i Kahoot.it:

Og i Poll Everywhere kunne det se således ud:

[1] Hendricks, VF & Wiewiura, JS *Derfor ødelægger sociale medier din koncentration: Pinball-effekten*.

Selve programmet fungerer således, at den enkelte studerende logger sig ind på hjemmesiden via en pin-kode og herefter deltager i quizzen, som vises på projektorerne i lokalet. Hver enkelt studerende besvarer quizspørgsmålene, og programmet viser det korrekte svar og en anonym fordeling af besvarelserne efter hvert spørgsmål.

I Poll Everywhere er det muligt løbende at monitorere fordelingen og dermed mulige ændringer i besvarelserne, hvilket kan dokumentere et skift i de studerendes besvarelser oven på sidemandsdiskussionerne.

Hvilke læringsmål knyttedes til aktiviteten?

Quiz-formen anvendtes ikke stringent i udførelsen, og pointfunktionen forsøgtes nedtonet. I stedet anvendtes quizzerne til at afdække lakuner i læringen hos de studerende, som derpå kunne adresseres efter det pågældende spørgsmål, inden jeg igangsatte det næste spørgsmål. Aktivitetens funktion i forhold til læringsmålene afhænger af spørgsmålenes kompleksitet. De simple spørgsmål var rettet mod at give de studerende *viden* om ansættelsesretlige regler, mens de mere komplekse var rettet mod at lære de studerende *færdigheder* i at identificere og analysere ansættelsesretlige problemstillinger og foruddiskontere juridisk holdbare løsninger i kraft af svaret. Dernæst knyttede quizzernes mest komplekse og diskutable spørgsmål sig til at lære de studerende *kompetencen* til at varetage opgaver af arbejdsretlig karakter vedr. HR og personale inden for såvel den private som den offentlige sektor – af dem var der dog få, idet cases var et mere oplagt værktøj til det formål.

Alignment i forhold til eksamensformen

Eksamen i faget er mundtlig og baseres på et teoretisk emne ud fra pensum og en 5-sider synopsis, som de studerende har indleveret. Brugen af *think-pair-share* som led i quizzerne motiverede de studerende til at anvende begreberne og de retlige strukturer fra pensum under diskussioner med sidemanden for derigennem at omsætte de autoritative ord til egne overbevisende ord, hvilket, foruden at knytte sig til fagets læringsmål udi hhv. viden og færdigheder, også er en væsentlig bestanddel af den mundtlige eksamen.
Via sidemands-diskussionerne lærte de studerende færdigheder i argumentationsteknik, hvilket bl.a. indebærer at identificere og analysere ansættelsesretlige problemstillinger og foruddiskontere juridisk holdbare løsninger.

Think-pair-share

I *think-pair-share* aktiviteten indgår der, omend ikke eksplicit, et element af peer instruction, idet der oftest vil være en af de to studerende, der enten kender svaret eller har "bedre" argumenter fra pensum. Under disse diskussioner skabes desuden et trygt rum for den studerende til at italesætte sin egen viden frem for

at gøre det i plenum. *Sumanagala og Di Carlo*[2] understreger det gavnlige ved at anvende peer instruction, herunder ved at henvise til, at de studerendes korrekte svar-rate stiger, deres problemløsningsevne stiger ligeledes, og ligeså gjorde de studerendes opmærksomhedskapacitet. Sidstnævnte skyldes, at undervisningsformen indebar, at lektionen blev opdelt i små bidder af 12-15 minutter afbrudt af de omtalte diskussioner de studerende havde om spørgsmålene indbyrdes, hvilket bekræfter behovet for afvekslende læringsaktiviteter.

Opnået effekt og erfaringer

Jeg tilstræbte, at quizzerne og spørgeformen skulle "sparke gang i" de studerendes italesætning og formulering af egen viden, og den efterfølgende evaluering af aktiviteten bekræftede i høj grad, at quizzerne havde effekt på den oplevede læring og motivation hos de studerende. I særdeleshed *think-pair-share*-tilgangen var gavnlig for at få dialogen i gang, hvilket viste sig i evalueringen ved at 80% af de adspurgte studerende fandt, at sidemandsdiskussionerne gav bedre læring end de spørgsmål, hvor den ikke fandt sted.

Det er særligt motiverende for de mere usikre studerende, der via diskussionerne opbygges i troen på deres egen opfattelse og derpå er mere motiveret til at sige noget i plenum. Ved at bruge sådanne quizzer får man også en god adgang til at tjekke de studerendes viden, og via programmets øjeblikkelige afsløring af resultaterne kan man som underviser derigennem vurdere, om der er behov for at repetere emnet straks efter spørgsmålet. De studerende oplevede det som en "læringsfremmende" aktivitet.

Summespørgsmål og sidemands-diskussioner er velkendte størrelser, men jeg oplevede, at kombinationen af quizzerne og *think-pair-share* gav nogle ekstra fordele via bl.a. monitoreringen af de studerendes viden. Kahoot-quizzerne er meget "poppede" i deres udtryk og egner sig ikke til længere spørgsmål og længere svar, men formatet er fængende og fanger de studerende, herunder ikke mindst det justerbare konkurrenceelement.

[2] Sumanagala og Di Carlo, *Peer Instruction improves performance on quizzes i* ADV PHYSIOL EDUC 24, s. 51–55, 2000.

Journal Club – Kollaborativ kritisk læsning af videnskabelige artikler

Henriette Lorenzen, lektor, Bioanalytikeruddannelsen, Københavns Professionshøjskole

Baggrund

Bioanalytikeruddannelsen er en professionsbacheloruddannelse på 3½ år, der primært uddanner studerende til at varetage undersøgelser og analyser på hospitalslaboratorier. En del af bioanalytikerens opgaver består i at kvalitetssikre analyse- og undersøgelsesresultater, så resultaterne kan anvendes diagnostisk.

Uddannelsens 6. semester er en kombination af praktik og teoretisk undervisning inden for én af uddannelsens seks specialiseringer. De studerende er i praktik i de første 13 uger, som følges op af teoretisk undervisning ved uddannelsesinstitutionen. Parallelt med praktikopholdet afvikles et mindre Journal Club forløb (JC), hvor de studerende arbejder med videnskabelige artikler relevante for deres praktikophold.
De studerende har, forud for dette semester, søgt og arbejdet med videnskabelige artikler på både 4. og 5. semester. På 6. semester har de studerende, grundet det længere praktikophold, større viden inden for én af specialiseringerne og dermed bedre forudsætninger for at reflektere over praksis med udgangspunkt i forskningsbaseret viden.

Det er for ganske mange af vores studerende en udfordring at læse en videnskabelig artikel. De studerende peger på, at det både er en tidskrævende og en kompleks opgave at vurdere en videnskabelig artikel og som underviser oplever jeg, at de studerende ikke altid når en tilstrækkelig faglig dybde.

Målet var derfor at stilladsere JC-forløbet med henblik på at understøtte de studerende i kritisk læsning af videnskabelige artikler.

Mål

Forløbet korresponderer med følgende udvalgte mål fra beskrivelsen af semestret. Målet er at den studerende

- Kan reflektere over udviklings- og forskningsbaseret viden
- Kan vurdere evidens- og erfaringsbaseret viden i relation til professionsudøvelsen inden for relevante forsknings- og udviklingsfelter
- Kan vurdere og fortolke empiri, teori og forskningsmetoder

Det er således ambitionen, at de studerende kan vurdere artiklers relevans, troværdighed og anvendelighed samt reflektere over praksis med udgangspunkt i empiriske forskningsresultater (Studieordningen, 2016; Haastrup et al., 2013).

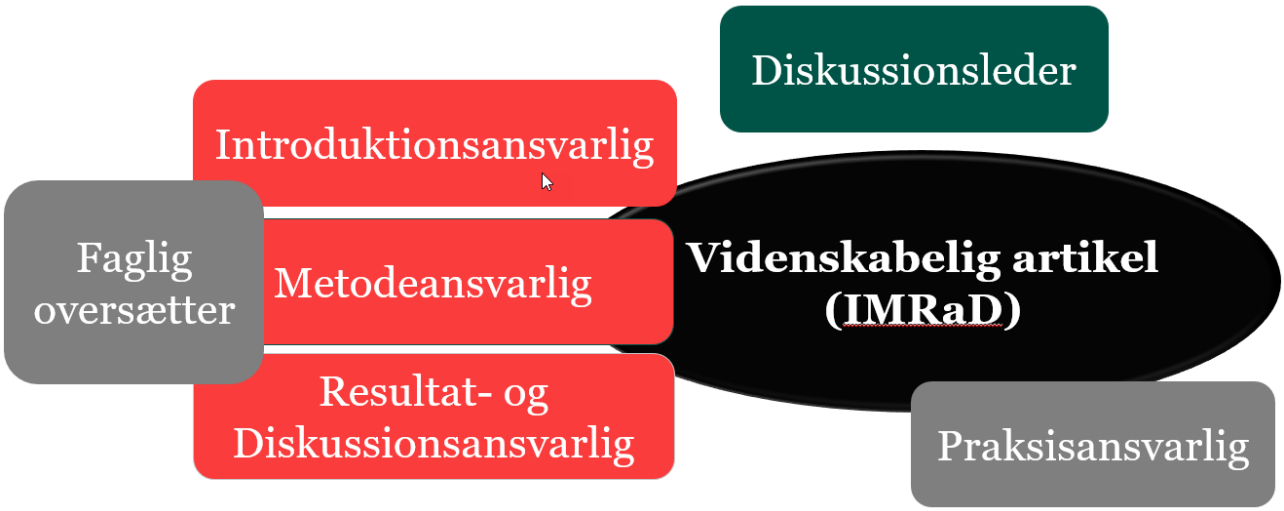
Didaktisk design

Ved JC læses originale peer-reviewed artikler, som undersøger praksisnære problemstillinger relevante for de studerendes specifikke praktikophold samt artikler som har haft afgørende betydning for nuværende professionspraksis indenfor for specialiseringen, som de studerende er tilknyttet.

JC-forløbet afvikles som to møder á 3 lektioner, hvor en studiegruppe på 5-6 studerende arbejder med to videnskabelige artikler pr. møde.

Artiklerne er naturvidenskabelige og derfor opbygget efter IMRaD-formatet med et introduktionsafsnit, et materiale og metodeafsnit, et resultatafsnit og et diskussionsafsnit.

JC-forløbets didaktiske design er inspireret af *Bookworms Club Reading Circles* (Oxford University Press, u.å) og knytter sig til IMRaD-formatet, idet de studerende på skift påtager sig forskellige individuelle roller; diskussionsleder, introduktionsansvarlig, metodeansvarlig, resultat- og diskussionsansvarlig, faglig oversætter og praksisansvarlig (figur 1).



Figur 1. Fordelingen af roller ved Journal Club. Introduktions-, metode- samt resultat- og diskussionsansvarlig (rød) er direkte knyttet til artiklens IMRAD-format (sort). Faglig oversætter (grå) er indirekte knyttet til IMRAD-formatet. Praksisansvarlig (grå) er knyttet til artiklens anvendelighed. Diskussionsleder er knyttet til processen for Journal Club (grøn)

Designet tager udgangspunkt i principperne for kooperativ læring, som ved omhyggelig strukturering af de studerendes samarbejde, har vist sig at være en effektiv metode til løsning af komplekse opgaver. Gruppesamarbejdet tilrettelægges således, at gruppens løsning af den fælles opgave, kun lader sig gøre gennem de studerendes individuelle målopfyldelse. Forventningen er, at samarbejdet styrkes gennem motivation for at løse selve opgaven, social samhørighed og ved at øge de studerendes indbydes afhængighed i opgaveløsningen (Slavin, 2014).

Rollerne er designet, så de netop er indbyrdes afhængige i forhold til kritisk læsning af videnskabelige artikler. Hver studerende præsenterer interafhængige informationer, gruppen samler informationerne og det er herefter tanken, at de studerende i fællesskab skal drage kollaborative slutninger gennem diskussion, argumentation, ved at lytte til andres synspunkter og ved at forhandle (Deiglmayr, 2010; Wenger, 2008). Ambitionen er, at de studerende føler sig forpligtet til at bidrage og til at hjælpe hinanden (Slavin, 2014).

Artiklerne vælges i fællesskab af den teoretiske og den praktiske underviser og begge deltager i JC-mødet. Undervisernes rolle er faciliterende i retning af at stille spørgsmål under JC-mødet, som hjælper de studerende til at aktivere eksisterende viden og som understøtter refleksion over praksis.

Rollebeskrivelser

De forskellige rollers opgave er defineret af indholdet i de enkelte afsnit i IMRaD-formatet og hvordan det pågældende afsnit kvalitetsvurderes.

Den første opgave løses af den faglige oversætter, som skal understøtte øvrige deltagere i læsning og forberedelse af artiklen. Opgaven ligger forud for øvrige roller og mere konkret betyder det, at den studerende skal oversætte ord og sætninger, som er centrale for forståelsen af artiklen og dele disse med de øvrige studerende i studiegruppen.

Under JC-mødet har diskussionslederen ansvaret for at studiegruppen i fællesskab, når i mål med at vurdere artiklen og reflektere over praksis med udgangspunkt i artiklen. Diskussionslederen skal sikre, at alle deltager og får taletid samt at fokus og relevans fastholdes for diskussionen. Derudover skal diskussionslederen forberede spørgsmål, som indskydes undervejs i diskussionen. Spørgsmålene skal hjælpe studiegruppen til at diskutere artiklens relevans, troværdighed og anvendelighed.

Den introduktionsansvarlige har til opgave at formidle forskningsfeltet og problemstillingen. Overordnet set præsenteres forfatter, tidsskrift og årstal for publikationen. Den studerende formidler nødvendig baggrundsviden og eksisterende empiri, med inddragelse af anden teoretisk baggrundslitteratur, for at de medstuderende kan forstå problemstillingen og formålet med studiet. Dette leder frem til at den studerende præsenterer og vurderer problemstillingens relevans.

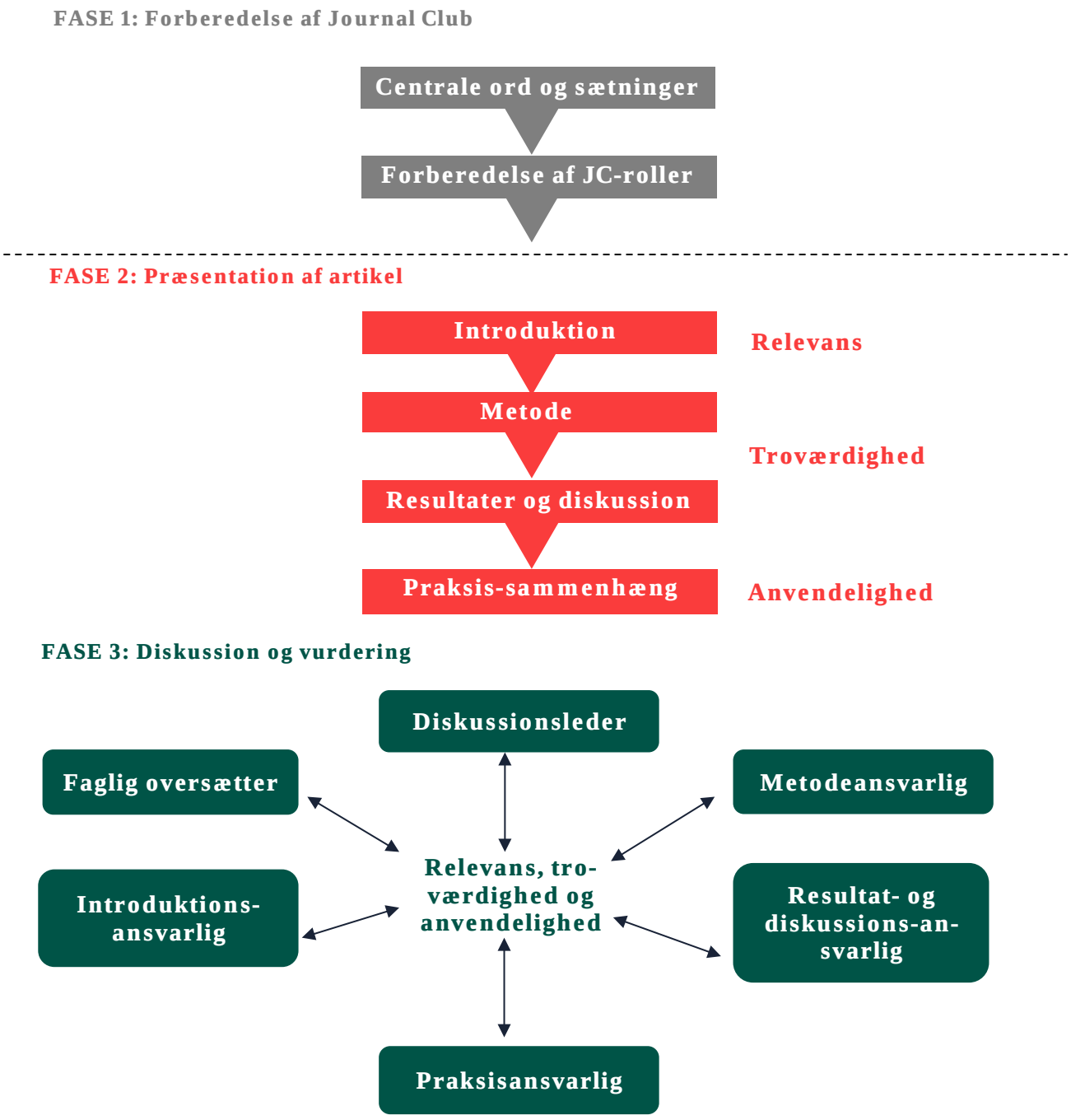
Den metodeansvarlige har til at opgave at formidle studiets anvendte undersøgelsesmetode. Det betyder mere konkret, at den studerende forholder sig til studiets design, den undersøgte population, fremgangsmåden og hvordan data behandles. Den studerende forventes desuden at gennemgå de teoretiske principper for studiets anvendte laboratorieanalyser.

Den resultat- og diskussionsansvarlige formidler studiets væsentligste fund og fortolkningen af resultaterne. Den studerende forholder sig herunder til hvordan resultaterne er præsenteret og hvorvidt der er sammenhæng mellem teori og empiri. Den studerende forventes at vurdere resultaternes gyldighed og pålidelighed samt studiets styrker, svagheder og begrænsninger.

Den praksisansvarlige formidler sammenhængen med praksis og kommer med konkrete bud på sammenhænge fra nuværende og eventuelt fra tidligere praktikophold. Den studerende forventes derudover at forholde sig til studiets betydning for nuværende professionspraksis.

Ved studiegrupper med færre end seks studerende er enkelte studerende, blevet tildelt to mindre roller. Faglig oversætter og diskussionsleder er f.eks. mindre arbejdskrævende og kan derfor varetages af én studerende. Ved studiegrupper med flere end seks studerende kan dette løses ved opdeling af roller i to mindre roller. Den metodeansvarliges opgave kan f.eks. fordeles på to studerende, således at én studerende forholder sig til studiets design, populationen og hvordan data behandles, og en anden studerende forholder sig til de teoretiske principper for studiets anvendte laboratorieanalyser. På lignende vis kan rollen som resultat- og diskussionsansvarlig fordeles på to studerende, således at én studerende forholder sig til resultatafsnittet og en anden studerende forholder sig til diskussionsafsnittet.

Det samlede design for Journal Club er visualiseret i figur 2.



Figur 2. Didaktisk design for Journal Club. De studerende forbereder rollerne individuelt (fase 1, grå). JC indledes med de studerendes individuelle præsentation (fase 2, rød) og afsluttes med studiegruppens diskussion og vurdering af artiklen (fase 3, grøn).

Resultater og diskussion

Læringsaktiviteten er gennemført for otte studiegrupper á 5-6 studerende i perioden 2015-2018 og evalueret af de studerendes ved en spørgeskemaundersøgelse, som efterfølgende er kvalificeret ved en mundtlig evaluering.

Overordnet set viser evalueringerne, at gennemsnitligt 60 % af de studerende mener, at JC i meget høj grad eller i høj grad har bidraget til deres læringsudbytte.

De studerende giver generelt udtryk for, at kritisk læsning af videnskabelige artikler forsat er vanskeligt, men at JC er en god øvelse i at stille kritiske spørgsmål.

De studerende sætter pris på fordelingen af ansvar gennem rollerne, så man som studerende ikke skal præsentere en artikel selvstændigt:

> *"Jeg synes det har været godt at rollerne har været delt ud, i stedet for at man skulle stå for sin egen artikel"*

De studerende peger på at ansvaret for en mindre del af en artikel tvinger til fordybelse i IMRaD-formatet:

> *"Det gør at man bliver tvunget til at læse et afsnit mere grundigt"*

Fordelingen af ansvar tvinger til fordybelse i samtlige artikler, hvilket fremmer aktivering af alle studerende ved JC-mødet og dette er med til at understøtte dialog:

> *"Det gode ved det er at alle får sagt noget og har læst artiklen"*

Gennem dialog vendes forskellige synspunkter og indholdet diskuteres, hvilket de studerende ser som fremmende for forståelsen:

> *"Nogle gange, hvis en artikel er svær at læse eller forstå, kan det være rigtig godt at høre hvordan andre* har *forstået artiklens budskab"*

> *"Man får en bedre forståelse af artiklerne når man diskuterer indholdet af dem"*

De studerende giver udtryk for, at rollernes arbejdsbelastning er forskellig og at rollerne ikke har lige stor værdi i forhold til læringen:

> *"Jeg synes, der er nogle roller man får mere ud af end andre, men kan godt forstå at de andre roller også er væsentlige for at få en diskussion og en dialog om artiklen i gang"*

Studiegrupperne inkluderet i evalueringen havde forskellige holdninger til, hvilke roller der havde mindre værdi i forhold til læringen. Nogle grupper mente, at diskussionslederen kunne undværes og andre grupper mente, at den faglige oversætter kunne undværes. Begge roller er dog fastholdt med begrundelsen om, at diskussionslederen fremmer de studerendes selvstændige studieindsats og at den faglige oversætter fremmer de studerendes fordybelse i det akademiske sprog.

Læringsaktiviteten er ydermere evalueret af fire undervisere, som har deltaget i JC-møderne.
Underviserne peger på, at de individuelle roller ansporer, de studerende til at tage ejerskab og fordybe sig i de enkelte afsnit i IMRaD-formatet. Under JC-mødet bliver de studerende eksperter på deres ansvarsområde og dette opleves som fremmende for diskussionen. Underviserne oplever desuden, at de studerende gennem diskussion stimulerer hinanden til refleksion og at de studerendes forhandling af synspunkter øger det taksonomiske niveau.

Underviserne fremhæver artiklernes kobling til de studerendes praktikophold, som en styrke i forhold til de studerendes refleksion over praksis og at dette understøtter erfaringsudveksling mellem studerende, som har været i praktik på forskellige kliniske afdelinger.

Jeg ser erfaringsudveksling og diskussion af forskellig professionspraksis, som en væsentlig forudsætning for refleksion over forskningsbaseret viden og kritisk læsning af videnskabelige artikler.

Konklusion

Journal Club er et forum for analyse og kritisk diskussion af forskningsresultater, som hyppigt anvendes i undervisningen på videregående uddannelser og som kompetenceudvikling i forbindelse med efter- og videreuddannelse.

Denne undersøgelse viser, at tilrettelæggelse af Journal Club med udgangspunkt i principperne for kooperativ læring er en velegnet metode til at understøtte de studerendes kritiske læsning af videnskabelige artikler.

De studerendes evaluering og undervisernes observationer peger på, at fordelingen af ansvaret gennem skiftende roller bidrager til individuel fordybelse og dermed dybere forståelse af IMRaD-formatet. De studerendes aktive deltagelse i diskussionen bidrager til at fremme refleksion over praksis med udgangspunkt i forskningsresultater.

Designet understøtter derfor på den ene side fordybelse i IMRaD-formatet og på den anden side aktiv deltagelse i diskussionen af artiklen. Begge dele er elementer, der styrker de studerendes færdigheder i kritisk læsning af videnskabelige artikler.

Afrunding

Forskningsbaseret viden er en væsentlig del af vidensgrundlaget på videregående uddannelser og derfor er kritisk læsning af videnskabelige artikler en vigtig disciplin at mestre for studerende. Under forudsætning af at rollerne tilpasses vurderes designet derfor at kunne være relevant på tværs af uddannelsesniveauer og videnskabelige områder.

I designet er der lagt vægt på, at de studerende reflekterer over professionspraksis med udgangspunkt i forskningsbaseret viden. Praktikophold vurderes imidlertid ikke at være en forudsætning for anvendelse af designet, idet arbejdet med artiklers anvendelighed er et centralt element i alle former for forskningsbaseret undervisning og således uafhængig af praktikophold.

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At udvikle sig selv og sin rolle som studerende i teambaserede innovationsforløb – erfaringer med kompetenceafklaring i undervisningen på Humaniora

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Introduktion og baggrund

I det postmoderne samfunds uddannelsessystem opstår nye metaforer for Universitetet, eksempelvis i form af begrebet *The Creative University*, hvor en af opgaverne for undervisere består i at skabe læringsrum gennem undervisning, der har fokus på studerendes skabende processer og samarbejde med omverdenen gennem kreativitet og innovation (Barnett 2011, Gibb 2012, Etzkowitz 2013). Erfaringer med disse undervisningsformer viser, at de studerendes engagement og muligheden for at realisere innovative projekter øges, blandt andet fordi man pædagogisk kan trække de studerendes erfaringer og interesser fra hverdagslivet ind i undervisningen (Moberg & Vestergaard 2013, Jensen 2014, Blenker et al 2014). Samtidig ses der i litteraturen tendenser til en kobling af dannelsesbegreber og denne form for læring gennem et såkaldt holistisk perspektiv på uddannelse (Fellenz 2016, Jensen 2018). Begrebet *'the ontological turn in higher education'* anvendes til at beskrive hvordan studerende kan få mulighed for at udvikle sig selv om mennesker, danne deres identitet, samtidig med at de tager en uddannelse (Fellenz 2016). Her forstås studerendes innovative læreprocesser som en udvikling af selvet - en løbende personlig og professionel udvikling med udgangspunkt i kreative forløb sammen med andre studerende og eksterne samarbejdspartnere – hvor kontinuerlig handling og refleksion bidrager til en selvbevidsthed om egne kompetencer (Jarvis 2006, McGowan & Partridge 2014, Yousef- Hassidim 2016).

Således er der både fokus på individet og individets samspil med andre i Det Kreative Universitet. Gennem interaktioner i innovative processer udvikles man som studerende både på et personligt og et socialt plan.

Udgangspunktet for mit arbejde med innovative læreprocesser på Humaniora er ovenstående holistiske tilgang til undervisningen. Afsættet for innovation er en videreudvikling af en af de dominerende definitioner af entreprenørskab: *Konstruktion, evaluering og udnyttelse af muligheder* (Nielsen et al 2009/17, Jensen 2014). Innovative læreprocesser sker gennem den (sociale) konstruktion og udvikling af ideer, der evalueres gennem interaktioner og feltarbejde, hvorefter de vurderes med det formål at kunne realiseres i en eller anden form. Denne tilgang kombineres med en *effektuel logik,* hvor forståelsen af det entreprenante menneske er, at nye initiativer som oftest sker med udgangspunkt i de involverede personers egen viden, erfaringer, behov og netværk (Sarasvathy 2001, Read et al 2011). Derfor sættes der fokus på de studerendes forskellige former for forudsætninger, interesser og kompetencer bredt som optakt til de innovative forløb, som undervisningen handler om.(Hedges 2012, Jackson 2013, Jensen 2014).

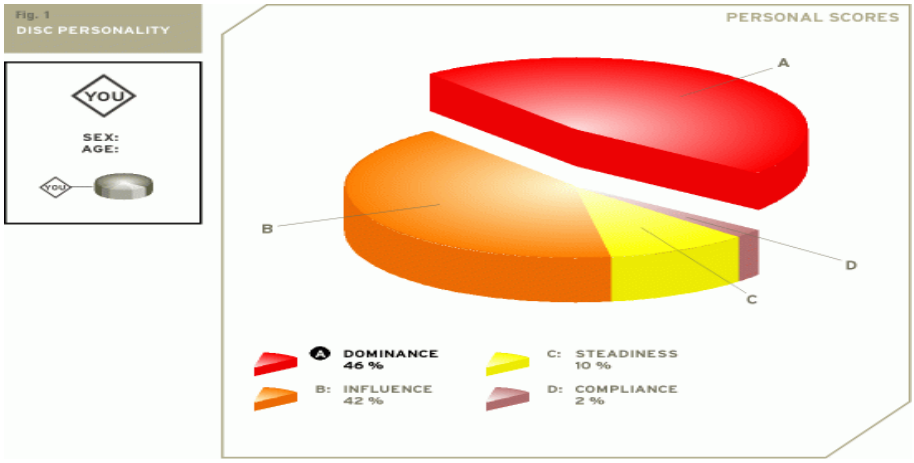
De konkrete undervisningsforløb foregår blandt andet i faget *Innovation, Projektledelse og Teamsamarbejde* på 4. og 6. semester på BA-uddannelsen i International Virksomhedskommunikation, hvor det indgår i den obligatoriske fagpakke. Studerende fra andre uddannelser på Humaniora kan tage faget som valgfag. Som regel er der mellem 30 og 40 studerende på hvert hold, hvoraf ca. 25 % er valgfagsstuderende.

Den overordnede ramme for faget er, at de studerende på baggrund af individuel kompetenceafklaring i starten af forløbet sættes sammen i teams på 3-4 personer. I disse teams udvikler de innovative ideer, som de lokaliserer potentielle samarbejdspartnere til, evaluerer gennem feltarbejde, og opstiller en projektplan for, for at kunne vurdere, om ideen skal realiseres og i hvilken form i forlængelse af definitionen på en innovativ læreproces ovenfor.

Inddelingen i teams sker ud fra en antagelse om, at komplementære teams giver en god basis for læring om egne kompetencer og udvikling af en øget forståelse af forskellige roller og arbejdsopgaver i teamsamarbejdet (Carlile 2002, Jensen 2014, Kristiansson 2017). Formålet med at fokusere på kompetenceafklaring og samarbejde i teams er, at de studerende udvikler bevidsthed om egne forudsætninger for at indgå i et teamsamarbejde som et afsæt for at kunne skabe innovative initiativer.

Person profil tests som et element i afklaring af individers kompetencer og roller i innovative teams

I det følgende zoomer jeg ind på ét ud af en række greb i den individuelle kompetenceafklaring, der altså danner baggrund som teamsammensætningen i starten af fagets forløb. En såkaldt person profil test tilbydes til de studerende på holdet. Der anvendes en gratis version af test systemet DISC, som er udviklet af Thomas International A/S. Testen opererer med fire variabler, D, I, S og C og peger kort fortalt på den enkelte persons tilbøjelighed til beslutningsgrundlag, være overvejende udadvendt eller indadvendt i samarbejdsrelationer, agere selvstændigt eller have behov for rammer, samt i hvor høj grad man har fokus på detaljer eller overordnede mønstre. Den tages online, og resultatet vises i et lagkagediagram illustreret gennem et anonymiseret eksempel nedenfor:



Herefter kan den studerende sætte resultatet i forhold til de andre øvelser om kompetenceafklaring og reflektere over, hvordan han/hun kunne tænkes at agere i et samarbejde med andre studerende i et team. Hver studerende laver en oversigt over sine forskellige kompetencer, inklusive resultatet af sin DISC test, giver en kopi til underviseren, hvorefter oversigterne bruges til at sammensætte teams. I det nyetablerede teams starter processen med, at de studerende fortæller om deres kompetencer og testresultat til hinanden, hvorefter de diskuterer hvordan de supplerer hinanden, hvilke typer af arbejdsopgaver og roller kompetencerne lægger op til, hvordan de kan håndtere mulige konflikter, samt hvordan de kan organisere deres arbejdsproces, så det matcher de forskellige typer af profiler, som de hver især har. Gennem hele forløbet opfordres de studerendes til aktivt at anvende deres kompetenceoversigter til at fordele opgaver.

Når undervisningen nærmer sig afslutningen, anvendes den sidste undervisningsgang til en række nye øvelser, der for den enkelte skal munde ud i overvejelser om, om der er opbygget nye kompetencer i forløbet og om resultatet af deres person profil test afspejler, hvordan teamsamarbejdet er gået. I slutningen af forløbet skal hvert team aflevere en projektplan for den idé, de har arbejdet med gennem semestret. Heri indgår de enkelte teammedlemmers kompetenceoversigter, og der er flere afsnit i projektplanen, hvor de skal inddrage og reflektere over deres kompetencer individuelt og i samspillet.

Læringsmål

Ud over fagbeskrivelsens generelle læringsmål for forløbet, har jeg opereret med implicitte læringsmål for den specifikke aktivitet omkring kompetenceafklaring – herunder anvendelsen af personprofiltesten. Min intention var at give den enkelte studerende mulighed for at få *tydeliggjort sine faglige og personlige forudsætninger* ved at udarbejde et sæt af øvelser ud fra den effektuelle logik, der som nævnt fokuserer på eksisterende viden, erfaringer og netværk hos den enkelte som basis for at udvikle nyt. Herefter var formålet at sammensætte teams på 3-4 studerende med forskellige profiler I teams på baggrund af individuel kompetenceafklaring for at *øge anvendelsen af de studerendes kompetencer i et konkret samarbejde* i en tryg ramme som forberedelse til et arbejdsliv, hvor man som højtuddannet ofte arbejder på tværs af vidensområder og funktioner. Kompetenceafklaringen – herunder person profils tests – havde desuden til formål at give de studerende i teamet *et 'sprog' for deres roller og adfærd*, som de så kunne anvende i forbindelse med deres opgaver i teamet, samt deres personlige udvikling.

Evaluering og refleksion

Ved at skabe et rum i undervisningen for, at de studerende får sat fokus på deres forskellige former for forudsætninger for at indgå i en læreproces, oplever de, at de udvikler sig både på personligt og fagligt niveau. Det ser ud til, at det personlige element virker som en løftestang for faglig udvikling, og at kompetencefokus er én metode blandt mange andre til at få skabt sammenhæng. Effekten har generelt været, at de studerendes bevidsthed om egne kompetencer og læring er blevet øget, fordi opgaverne i teamarbejdet blev løst ud fra deres specifikke forudsætninger. Dermed blev engagementet også forøget – deres kompetencer og deres processer var udgangspunktet, og herefter blev teorier og værktøjer taget i brug. Læring blev herved en 'personligt projekt', som var vedkommende for den enkelte studerende i samspillet med de andre i teamet.

Personprofil testen tilbyder – sammen med de andre øvelser i kompetenceafklaringen – et fælles sprog, de studerende kan gå i dialog med hinanden ud fra. Det giver den enkelte person i teamet en mulighed for at påtage sig roller og opgaver ud fra et andet parameter end tilfældigheder, vaner, kemi, etc. – og dermed peger det mod en professionalisering af roller, som de studerende kan overføre til andre kontekster på studiet og senere i arbejdslivet.

De fleste (gennemsnitligt 80-85 % årligt) evaluerer brugen af test i kombination med de øvrige værktøjer som værdifuldt for selve faget (kort sigt) og for deres mulighed for at anvende det fremadrettet (langt sigt) – til trods for, at mange er skeptiske overfor det i starten af det faglige forløb. Brugen af person profil tests bør således diskuteres med de studerende og ikke udgøre det eneste grundlag for teamsammensætning og kompetenceafklaring.

Nedenstående er et eksempel på erfaringer fra en studerende, baseret på en samtale i efteråret 2018:

I forbindelse med et internt projekt, hvor jeg møder den studerende 2 år efter personen har deltaget i forløbet med kompetenceafklaring og personprofil testen siger hun, at denne afklaring bidrog centralt til hendes muligheder for at kunne beskrive sine kvaliteter både i forhold til sit nuværende studiejob og et projektorienteret forløb, hun sidder i dette semester. Det har også givet hende en retning på, hvilke arbejdsopgaver og stillinger, hun oplagt kunne søge, samt hvordan hun typisk vil gribe en opgave an.

Videre perspektiver

Min praksis er udviklet til teams i innovative processer, men kan udbredes til andre typer faglige forløb, idet personlige og faglige kompetencer kan indlemmes som forudsætningen for forløbets indhold. Man behøver ikke have teams og innovation som omdrejningspunkt. Ligeledes kan aktiviteten foldes ud udenfor selve undervisningen:

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Qualitative Learner Analytics: Actions Speak Louder Than Numbers

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Introduction

This article calls for an increased student and learning transfer-oriented approach in learning analytics based on the definition by Simon (1999), who defines transfer of learning as *"There are three kinds of transfer: from prior knowledge to learning, from learning to new learning, and from learning to application"*. So far, the focus in learning analytics has been primarily on *"what"*, i.e. quantitative measurements of the performance of the students Siemens (2011). This article suggests an alternative and more learning transfer-centered approach, which focuses on *"how"*, i.e. qualitative measurements of the actions of the student and on feedback sessions with the student. In other words, it is argued that actions do speak louder than numbers.

The learning transfer-oriented model developed and tested in the experiments is a multi-step model using rubrics, screen recordings, data analysis, rubric feedback and face-to-face feedback sessions. The mentor and the learner meet physically during the feedback session, facilitating open recognition and positive learning transfer. Figure 1 below shows the model used during the pedagogical interventions.

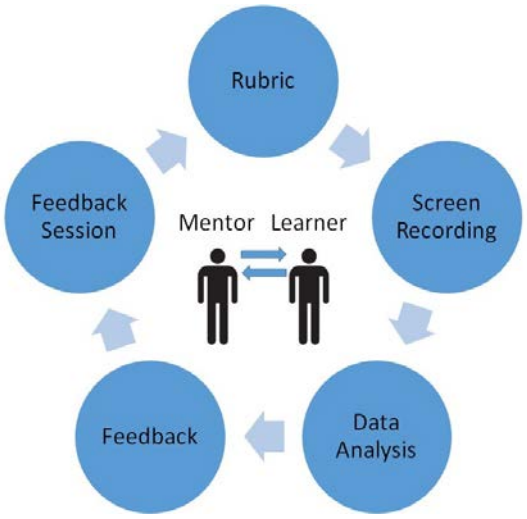

Figure 1

The pedagogical model shown in Figure 1 above can be used in the beginning, in the middle and at the end of a semester and may form part of a qualitative formative assessment approach based on teacher-student feedback sessions.

Problem

The objective of this article is to discuss how qualitative learning analytics based on screen recordings, feedback rubrics, self-evaluations and feedback sessions can be used to offer students more and better feedback. The questions examined in this article are:

- What characterizes the transfer-oriented qualitative learning analytics model?
- What characterizes the insights from the five interventions with the transfer-oriented qualitative learner analytics model based on screen recordings, feedback rubrics, self-evaluations and feedback sessions?
- What characterizes the student evaluations of the method used?

Methodology & Empirical Data

Five interventions in different classes at Copenhagen Business School were carried out in 2016-2018. The learning objective of the experiments was to enable the students to write professional and genre equivalent sales-oriented texts at LinkedIn. The actual teaching activities used in the interventions were writing exercises, where the students were asked to write a LinkedIn-article.

That particular learning activity made it possible to observe how the learning transfer-oriented model on qualitative learner analytics worked and what the students thought about feedback rubrics, screen recordings, self-evaluations and feedback sessions as part of their learning process.

A total of 75 students at Copenhagen Business School participated on five occasions. The participants were initially given written instructions. Subsequently they received the test case, switched on the screen recorder, worked on the case, handed in the screen recording and the case text, and finally they performed a self-assessment of their performance.

The interventions resulted in a total of 75 screen recordings (approx. 1 hour), 75 case texts (approx. 1 A4-page), 75 self-assessments (approx. 1 A4-page) and 75 feedback sheets (approx. 1 A4-page).

Results & Discussion

The analysis of the many screen recordings and feedback sessions seem to show that the qualitative learner analytics model developed in fact works and is applicable in practice. The screen recordings show how the students work and how they solve specific tasks, and they reveal things that the teacher might not otherwise detect. The analysis of the data also seems to show that qualitative learner analytics could be a value-adding supplement to conventional learning analytics and that it may improve student recognition, student-teacher relationships and transfer of learning. An example of a screen recording and an example of the rubric used are shown in Figures 2 and 3 below.

RUBRIC Communication Management 2017 - MSc - 1st semester			
	Below Standard	Approaching Standard	At and Above Standard
To which extent was the overall message conveyed? (That Immersion is a fantastic tool for university teachers)			
To which extent was the overall message tailored for the segment? (That the message was targeted at university teachers etc.)			
To which extent did the message use the following items? (Headline, Introduction, Sub-Headlines, Body, Conclusion and Call-to-Action)			
To which extent was the article structured, coherent, cohesive and concise? (Cohesion and coherence)			
To which extent was the language used in the article correct? (Lexical, syntactical and textual correctness)			
To which extent did the author use copywriting techniques? (Such as tilting the perspective, using stunning leads or other methods)			

Figure 2

The data show that the combination of screen recordings and rubrics is powerful, and it becomes even more powerful when students are offered rubric feedback by the teacher or peer feedback, feedback sheets from the teacher, and student-teacher feedback sessions as shown in Figures 3 and 4 below.

RUBRIC FEEDBACK Communication Management 2017 - MSc - 1st semester			
	Below Standard	Approaching Standard	At and Above Standard
To which extent was the overall message conveyed? (That Immersion is a fantastic tool for university teachers)			X
To which extent was the overall message tailored for the segment? (That the message was targeted at university teachers etc.)			X
To which extent did the message use the following items? (Headline, Introduction, Sub-Headlines, Body, Conclusion and Call-to-Action)			X
To which extent was the article structured, coherent, cohesive and concise? (Cohesion and coherence)			X
To which extent was the language used in the article correct? (Lexical, syntactical and textual correctness)		X	
To which extent did the author use copywriting techniques? (Such as tilting the perspective, using stunning leads or other methods)		X	

Figure 3

FEEDBACK SHEET Communication Management 2017 - MSc - 1st semester	
Use of tools	You seem to have a high command of different IT tools. You navigate effectively between and to and from Word, Internet sources and reference works. You arrange windows vertically, which allows you to concentrate on both assignment text and your text (2:58). Tip 1: You might consider arranging open windows horizontally.
Writing process	You seem to have a rather effective writing process, where you start from the top and you write in one consecutive sequence. You do not write, delete and write. Tip 2: You should use the automatic spellchecker when writing.
Editing process	You also seem to have a rather effective editing process. You start editing the text once you have completed the text and you bold relevant headlines (7:32). In your editing process, you add information and relevant icons etc. Tip 3: You should remember to spellcheck the document.
Language (lexis and syntax)	Your language is satisfactory, however, I would like to give you the following tips Tip 4: Check your use of prepositions (specialize in) Tip 5: Check your use of relative pronouns (Immersion, who) Tip 6: Check your use of formality level (if you want to get more familiarized with) Tip 7: Check your use of modality verbs, especially future tense "will" (I will be happy to) Tip 8: Check your use of apostrophes in possessives (Visit TeachTechs LinkedIn page)

Figure 4

Based on the analysis it is argued that the use of screen recordings in teaching is relevant and effective, because they improve the feedback quality to the students and because they make the feedback fact-based and situation-specific with a clear focus on "what and how" Simonsen (2018). Based on the experiences from the five separate administrations of the intervention, it is also argued that the degree of generalizability and transferability of the pedagogical model described in Figure 1 above is high, and it is argued that the model can be used in both elementary school and in higher education institutions. Participant 1 describes this as follows:

> *Screen recordings helped me to find out how much time I spent on activities like jumping from screen to screen instead of focusing on writing assignments. By seeing how I spent my time on the screen, I had the basic tools to manage my time better and to get tasks done more efficiently. The personal feedback rubrics gave me a better understanding of where I could improve my portfolio assignments, instead of getting an overall comment in the end of the assignment. The rubrics were detailed and concise, which helped me improve my weaknesses.*

Furthermore, it is argued, and also supported by student feedback, that this method improves the teacher-student relationship, and significantly enhances teacher presence and student learning. This is in fact clearly supported by student feedback, which illustrates the impact of the method used. Participant 2 writes:

> *The teacher motivated every student to become better, as he gave personal feedback in Rubrics throughout his course. This method gave the individual specific areas to work*

with, and it is a great way to help students to both identify and improve on specific areas of interest.

In addition, participants 3 and 4 seem to appreciate the use of screen recordings. Participant 3 argues: *"Screen recordings and rubrics made it easier to work on my own learning and to improve my assignments".*

Participant 4 supplements this view:

> *The teacher gave excellent and constructive feedback, which I have used since the experiment. Henrik's feedback was not only useful concerning the specific task, but also how I could improve my performance in the future. Since the experiment, I have produced written texts in better quality and become aware of how to write more targeted to a given audience. Also, the teacher advised me how to work smarter and save time when producing a written product, which has been an enormous help.*

By using screen recordings, the feedback can be more nuanced and also focus on how the student uses relevant models, tools, IT and specific theories. The relation between the student and the teacher improves and becomes social or "relation-based", see also (Järveläa et al., 2008). Students clearly seem to appreciate this, which can be seen from participant 8's evaluation. Participant 8 writes: *"Our teacher's didactical approach was very innovative and personal. By using screen recordings I felt like the feedback from the approach was tailored perfectly to me and very credible. It was something I found very useful when writing future papers."*

In summary, students appreciate the fact that they are offered structured and objective feedback based on rubric criteria and descriptions based on objective data in the form of video recordings.

Conclusion

The objective of this article was to present a learning transfer-oriented model on qualitative learner analytics.

It was found that the model developed in fact works in practice and that the use of rubrics, screen recordings, rubric feedback and face-to face feedback sessions significantly add to the perceptions of value of the feedback offered. It was also found that the students appreciate the personal feedback sessions based on screen recordings and feedback rubrics.

Admittedly, this process is very time-consuming, because the teacher needs to process many data and spend time on individual face-to-face feedback sessions with the students; however, it is argued that it is worthwhile because of the added value and quality of the feedback.

It is also argued that the model and the process developed can be used in all types of classes, all types of learning situations, and at all types of educational institutions and it is argued, that instead of offering students seven assignments with minimum feedback, we might instead offer the students assignments with maximum feedback in the initial, medial and final phases of a semester.

Additional research in qualitative learning analytics is needed, and it will be interesting to develop computer-assisted analysis of screen recordings for faster and more accurate feedback data.

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A study of active learning in educational roleplaying games and students' motivation

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Background

The aim of this article is to present the development of a collaborative learning activity in the form of an educational live action roleplaying game (or *edu-larp*), how it is articulated in the form of a co-constructed narration, and its impact on learners' self-determined motivation.

Educational roleplaying games are learning activities in which participants take on specific roles to accomplish a specific learning task, usually in a form a simulation of a real-life problem to be solved. Interest in the educational potential of edu-larps is recent, but already well-documented through the empirical studies of Bender (2005), Bowman (2014), Gjedde (2013), Standiford (2015), and Branc (2018), both in secondary and higher education. The project "Reacting to the Past" led by Mark C. Carnes at Barnard College was also an inspiration for the use of role-plays to engage students in learning history (Powers et al., 2009). Similarly, Kochumarangolil and Renumol (2018) consider project role-plays for developing project artifacts one of the foremost current active learning strategies, alongside the flipped classroom, teaching by example, and student seminars.

The development of this activity was built around central principles in active pedagogies and students' motivation in cognitive psychology. Viau (1997) especially insists on three aspects in students' motivation: a sense of competence, an understanding the finality of the learning task, and control of the activity. Furthermore, the self-determination theory (SDT) as formulated by Deci & Ryan (1985) was well-suited to study motivation in the educative context. The SDT relies on the idea that self-determined motivation depends on the satisfaction of three fundamental psychological needs: need of autonomy, need of competence, need of relatedness. We believed that developing an active learning activity could help us foster motivation in our students, by fulfiling the three fundamental needs of the self-determination theory: autonomy and competence through the development of a significant learning task that would allow students to develop their own stories, and need for relatedness through group work, and collective development of the story.

Students' learning outcomes

The activity was developed as a transdisciplinary activity in History and English for high school pupils of 10th grade in the French public Secondary school system. The learning objective of the activity was to encourage students to take a critical look at the period of European expansion called "the Great Discoveries" and develop their historical knowledge. It also focused on English skills, especially spoken communication. Finally, by encouraging a collaborative engagement in the task, the activity also aimed at developing soft skills, such as group work and oral presentation.

Description of the activity

The learning activity, an edu-larp, was entitled “Playing as the first Americans”. It encouraged students to act as great explorers from the European expansion period, from Christopher Columbus to John Cabot. The playing material (see, figure 1) encouraged students to research the biography of these characters, along with a few scene cues to frame the group work. Students were invited to prepare and then perform the scenes in front of the rest of the class.

3. John Cabot and the discovery of Northern America

Note: be aware that the instructions are only a basic canvas. You are free to elaborate as you wish, create new characters, situations, etc.

Characters: John Cabot, an explorer, sir Martin Frobisher, a noble, the King of England, Lorenzo Pasqualigo, a Venitian Merchant, Francesco Parqualigo, his brother

Scenes:

1 – John Cabot meets the King of England and sir Martin Frobisher. He introduces himself and his sailing experience. The King wants him to discover new land. Sir Martin want to start an economic venture to find spice and gold

2 – Lorenzo and Francesco comment on a letter they received from John Cabot. They comment on his successful voyage and regret that he didn’t stay in Venice. They decide to visit him

3 – Lorenzo and Francesco visit Newfoundland. They meet John Cabot and notice he put a Venetian flag to remember his home of origin. They discuss business opportunities

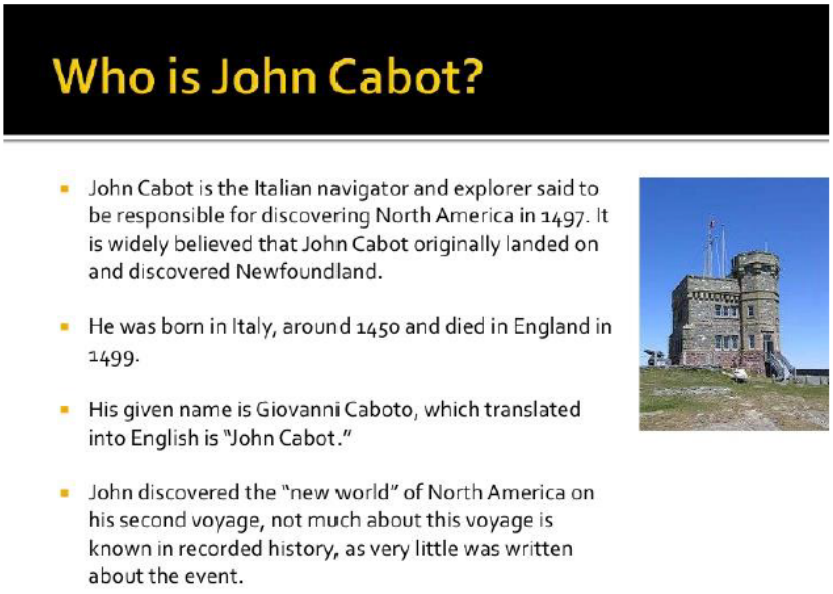

Figure 1. Screen capture from the edu-larp “Playing as the First Americans”

The activity was structured as a two-hour program consisting of short exercises and phases of work: presentation (10 min), scene preparation (40 min), rehearsal (30 min), performance (30 min), and debriefing (10 min).

During the first part of the preparation, students chose their own groups and then had to discuss with each other and decide the role distribution collectively. The facilitator only intervened in case of conflict, in which case the roles would be assigned randomly. Students were encouraged to develop, modify, and expand the scene structure as they wished. The only enforced rule was that each student was responsible for

their own character and decided what they would do in the story. This sole rule was devised to give each individual student a sense of agency and responsibility, encourage group discussion and collaboration, and to avoid any student taking a director's chair.

The biggest difficulty in developing this learning task was time and curriculum constraints. There were only two hours in which to develop the learning activity at the beginning of a new learning sequence, which is a short time and only allowed for an introduction to collaborative work.

The positive aspect of the activity was that all students could be active at the same time, as they were given a precise set of instructions and timing and were asked to complete each step of the preparation in a given time span. This structured approach to autonomous group work allowed each group to be able to perform a complete joint story in the two-hour allotted time slot. This structure also allowed co-constructed narration and emergent play: the scene structure given to the students was only a starting point, and students had to come up with new ideas and development before performing in front of the rest of the class.

Transferability of the method

Edu-larp is a very easy method to adapt to most subjects and class levels. It usually allows for students to engage in conversations and projects with the contextualization of a simulation and the alibi of a character. It doesn't necessitate any specific material, and, as our activity has proven, can be tried out over short exercises. The easiest and most frequent strategy in higher education is to get students to take the role of future professionals in project-based simulations (e.g Branc, 2018), but the project "Reacting to the Past" showed another strategy by inviting students to take the role of historical characters (Powers et al., 2009). The performative aspect of a professional, historical, or fictional role can thus be used as a gateway to support students' motivation in a variety of different subjects.

Evaluation of the activity

Conducting our research within the framework of the SDT, we used the motivation scale for secondary education by Vallerand (EMEs, Vallerand, 1991) to evaluate the edu-larp learning activity and its impact on students' motivation.

The activity was run in an experimental group of 70 students distributed on 3 different schools. The students attended 3 different high schools in the same region, coming from similar geographical and socio-economic backgrounds. The students in the experimental group were engaged in the edu-larp learning activity. Students from another class made up the control group and were engaged in a conventional learning activity for a History class: studying primary sources comprised of great explorers' journals and letters.

Both the experimental group and the control group were asked to fill in a questionnaire before and after the learning activity. The questionnaire fell in two parts: the first part was a motivation questionnaire using Vallerand's academic motivation scale (Vallerand, 1991), the second part, a self-reported survey, after the activity, evaluating the students' satisfaction with the activity for both groups. The students' motivation was evaluated using Vallerand's motivation scale in education which makes possible the calculation of a self-determination index for each student by pitting self-determined forms of motivation against non-self-determined forms of motivation and amotivation. The average of the self-determination index was calculated for each group, before the learning activity, and after the learning activity. After the activity, the self-

reported satisfaction was calculated for a number of criteria ranging from “I appreciated taking part in the activity” to “I would recommend this activity to other students”.

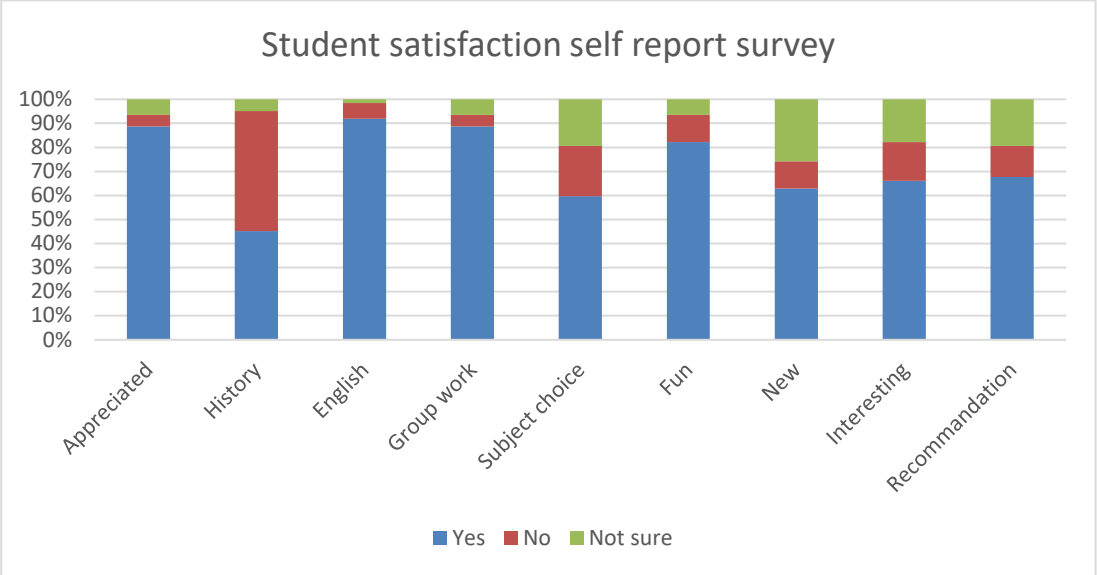

Figure 2: results of the students’ self-reported satisfaction survey for the experimental group.

As reported in Figure 2, the students’ satisfaction with the activity was evaluated on 9 criteria, from general appreciation in the activity to fun, interest in doing a similar activity again, and would they recommend the activity to another student. The options to the questions were on a yes/no/unsure scale. The students’ self-reported satisfaction in the activity was generally good, 88.71% reported that they enjoyed the activity, 91.93% thought it helped them in practicing English, 88.71% enjoyed doing group work, 82.25% thought the activity was fun, and 65% appreciated trying a new activity. Only 45.16% of the students, however, thought the activity could help them progress in History. The short duration of the activity and its placement at the start of a new curriculum sequence can be put forward as an explanation for this lower score.

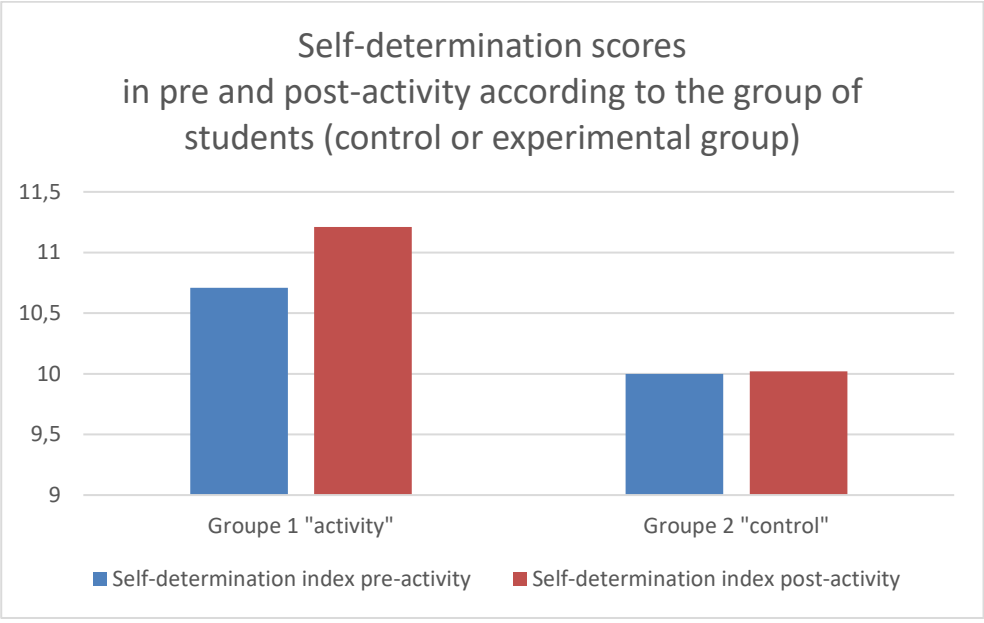

Figure 3: Average of the self-determination index before and after the learning activity

As reported in Figure 3, the experimental group went from an average of 10.71 on the self-determined index to 11.21, whereas the average motivation index of the control group went from 10.00 before the activity to 10.02 after the activity. Therefore, there was little change in the average score for self-determination in the control group. However, the experimental group, engaged in the active learning activity, presented an increase in the self-determination index, although they had started with a higher self-determined motivation index, which may be explained by the original interest in doing a different activity. We can therefore infer that engagement in the learning activity was not only appreciated by the students, but also had a positive impact on their self-determined motivation. The opportunity to work in autonomy and in small groups may be a factor in the positive reception of the activity by the students. Although the groups were too small to establish statistical significance, the outcome from the students' perspective can be considered as positive. From the teacher's perspective, it was a rare opportunity to develop an edu-larp and test it in French classes, an educational method that has been mostly marginal up to this point, and to open perspectives on the examination of the finer aspects of self-determined motivation in students.

Conclusion

The learning activity developed and investigated within this project allowed students to take control of the learning process by co-creating narratives within their group. The positive feedback of the students and positive impact on self-determined motivation, while not definitely conclusive, can be read as a good indicator of the potential of edu-larps as a collaborative activity.

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Bringing Experience into the Classroom

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Background

This document is a written presentation of the presentation given on TAL2018 regarding bringing experience into the classroom. The document is written based on the abstract submitted and the talk given at the conference.

The experiences presented in the paper is the result of the first phase of an e-learning project (FLOCS) supported by SDU3. Fig. 1 outlines the project.

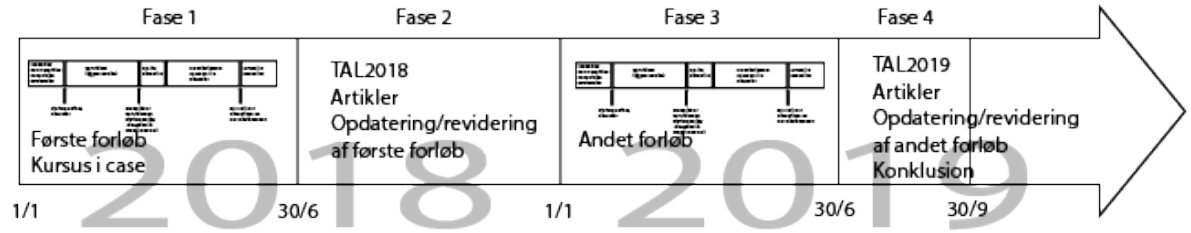

Figure 1: The FLOCS Project

Introduction

Teaching project management is often teaching the tools, processes, and models for project management, e.g. scoping, planning, estimation, etc. [Larson, 2018]. This is a necessary prerequisite for understanding project management but not sufficient to convey many of the organizational and people-oriented challenges in real life projects. The overarching learning objective of the model introduced in this paper is to bring real-life dynamics and experience to the classroom and prepare the students to apply tools, processes, and models to real-life problems. To address this learning objective the project introduces three levels or phases of teaching that address three different aspects of project management and the interaction with the context in which the project is situated.

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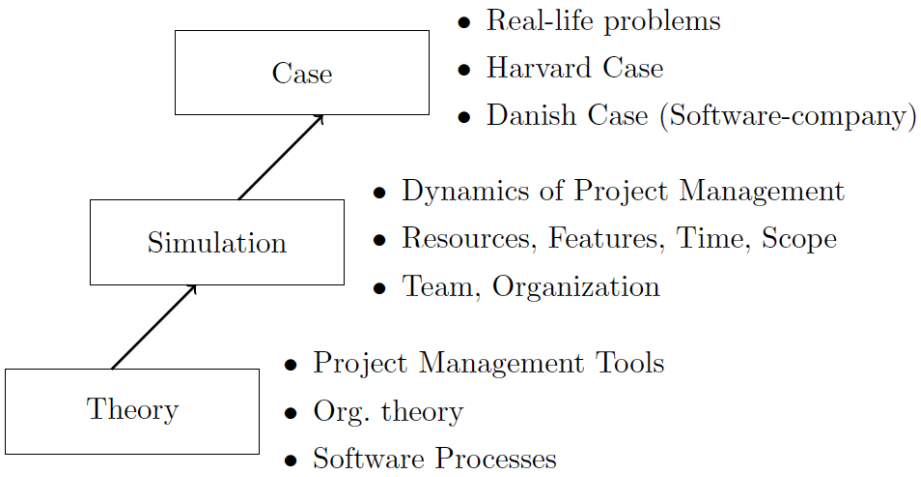

Figure 2: Three levels of teaching

The three levels are shown on fig. 2 and consist of *theory*, *simulation*, and *case(s)*. Each of the levels have their individual learning objectives that build upon the learning objectives from the previous level(s).

In the following sections we describe the levels from the perspective of *learning objectives*, *activities*, *experience*, and whether the experience and methods can be transferred to other subjects.

Project Management Theory

The learning objectives of the Project Management Theory part of the course is to teach the students the basic tools of project management, software processes, and organizations from a theoretical point of view, i.e. this part could be rather traditional, from a teaching standpoint, using classical lectures.

In order to avoid that pitfall the teaching consists of a mix of flipped learning with discussion, where the students constantly are encouraged to put the theory in relation to their own experiences by first reflecting over past experiences they may have had with projects and project management, and by relating the theories to their bachelor's project, which they are writing in parallel with the project management course. The learning experience is supplemented with videos and mini-cases.

The connection of tools and techniques to an ongoing (bachelor's) project has been working very well and qualitative mid-term evaluations have backed-up this observation. A crucial point is to ensure that the first lectures of the course are aligned with the (bachelor's) project and placed as early as possible in the semester. If the alignment fails, the motivation for using the course content fails as well.

Whether this method transfers to other subjects depends on the availability of a parallel activity that may be supported by the subject matter of the course.

Dynamics of Project Management

Projects do not live in isolation and the actions of the project manager affects the environment as well as the environment affects the project and the project manager. The tools and techniques learned in the first phase must be applied in a dynamic context. Thus, the learning objective of this part of the course is to enable the students to take decisions, experience the effect of the decisions, and to take corrective action. Another learning objective is to enable the students to synthesize cause-and-effect relations from the decisions they take.

To address these learning objectives, the students work with a software-based project management simulation. The simulation is a simplification of the context and parameters that affect a real-life project, but sufficiently complex and difficult to manage to infer the cause-and-effect relations. The simulation sets up a number of scenarios of increasing complexity thereby making it possible to start with a simple scenario that eases the students into the simulation and provides sufficient material to conduct initial discussion in class. The students are allowed to run the initial scenario as many times as necessary thus allowing experiments with how the different parameters interact, e.g. it is possible to create one run where resources are in focus and another where it is scope. The runs are associated with a score that reflects how well the simulation was run, thus making it possible to compare the different runs.

Working with the simulation turned out to be a very positive experience and the students were very engaged in the activity. Especially did the publication of the scores each student achieved in the runs encourage some competition between the students which spurred discussion in class on how to achieve a greater score. Thus, the derived effect of the score was a discussion of cause-and-effect which was the objective of the activity. However, it was more difficult to reach the same level of enthusiasm with the more complex scenarios.

The use of simulations clearly transfers to other areas where dynamics are essential. Whether it is possible to obtain computer simulations of relevant areas is outside the scope of this paper, but it would probably also be possible to use other kinds of simulations, e.g. paper-based, scenario-based, or role-play-based.

Real-life Case Studies

Cause-and-effect in a simulation and in real-life may be quite different and thus the inferences from the second phase are related to real-life project management problems experienced in companies through the use of case studies. The learning objective of this activity is to use the tools from the first activity and the experiences with the dynamics from the second activity on real-life cases. Another learning objective is to enable a future project manager to acquire sufficient information about a project through secondary sources to be able to create an action plan for the project at hand.

There are three activities in this phase. First a method for analyzing cases is presented [Ellet2007]; then a classic case [Gino2006] is presented and discussed; and finally cases from Danish software companies are presented [Worm2018]. The cases from Danish companies are, if at all possible, presented by the project manager that experienced the challenges described in the case.

The experiences with the case discussions are very positive; especially the cases that are presented by the project managers from the companies in question are received very well and the students participate in the class discussion and interact with the project manager.

The transfer of this activity to other areas depends on the availability of relevant cases and if the full effect of the activity should be reached also on the availability of guest lectures with the ability to present and discuss the cases. Case discussions may be conducted by the lecturer but the experience is that the subject being discussed becomes more realistic and "alive" when guest lectures attend.

Conclusion

The experiences in this paper are based on the first iteration of a new version of the course "Project Organization and Management" on the sixth semester of the Software Engineering programme and thus more iterations must be conducted in order to draw firm conclusion on the activities described in this paper. The results are, however, promising and the model is being further explored and improved in subsequent instances of the course.

The course has been taught two times with the first time being in a more conventional fashion and the second time using the model presented here. The students have clearly been more engaged with the new model and an indication of this was the fact that the number of students attending class did not go down through the semester - on the contrary it went up.

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Students as co-creators in planning, execution and evaluation of a course in learning, technical training and feedback in sports

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Camilla Damkjær, Assistant Professor, Department of Sports Science and Clinical Biomechanics, University of Southern Denmark

The authors of this article are both employed as associate professors at the Institute of Sport and Biomechanics (IOB) where they teach several courses relating to physical activity and learning. Camilla Damkjær is teaching BL 1,5,7 & 8 (see table 1). Jan Toftegaard Støckel is overall responsible for the movement and learning program and is currently teaching BL 1,5 and 10. The aim of this article is to shed light on the background and progression of the student involvement process that was first presented at the 2018 TAL-conference at SDU.

Background

> *There is too much boring one-way communication through endless power-points, and our lecturer is so busy giving us all the right answers, models and theories that I sometimes think he has forgotten about us. Sometimes I just turn off or leave during the break.*
>
> *My pedagogy lecturer always brings a little notebook and starts writing notes directly on to the blackboard. While standing with her back towards us, we are just going whaaaat the fuck is going on? how is this even possible in pedagogy?*

Keeping in mind that the founding principles at the University of Southern Denmark (www.sdu.dk) is active teaching and learning students, the two students above express frustrations about being lectured into passivity. According to Kuh (2008) students' active and participatory roles in learning is thought to enhance learning processes and outcomes. Thus, early calls for teacher-student collaboration by Dewey (1916) and experimental learning in real-life settings Lewin in 1939 (1999) came in the last century, we are currently witnessing an emerging body of research seeking to explore the learning capacities through students' voices (Fielding, 2001) and how student engagement and participation can be increased for the benefit of enhanced learning. Bovill, Cook-Sather & Felten (2010) argue that students' voices are frequently overlooked in the design of teaching approaches, courses and curricula. Drawing upon a 2009 (Bovill) research project examining the role of students as co-creators of first-year curricula in the USA, Ireland and Scotland, Bovill, Cook-Sather & Felten (2010) identify 3 types of co-creation: Students as co-creators of teaching approaches, students as co-creators of course design, and students as co-creators of curricula. Bovill and colleagues found that both students and academic staff experience enhanced engagement, motivation, and enthusiasm, and they both develop a deeper understanding of learning. Recommendations state that academic developers should invite students to be partners with academic staff in pedagogical planning to enhance student ownership of their learning, while also stressing the need for redesign by the next cohort of students to ensure that they achieve this same degree of ownership.

Drawing upon the theoretical notion that student engagement and participation is strongly tied to learning outcome, this article is illustrating how co-creation has been carried out at the University of Southern Denmark in 2018.

In 2017, the undergraduate education program at the Department of Sports Science and Clinical Biomechanics was revised, and ten new teaching modules were developed (BL 1-10) ranging between 3-7 ECTS (European Credit Transfer System), and with a total of 45 ECTS (see table 1).

BL1 - Learning I: Learning and cognition – 5 ECTS
BL2 - Outdoor adventure and experiential learning, part 1 and 2 – 5 ECTS
BL3 - Ball games I: Interactive ballgames in different social arenas - 3 ECTS
BL4 - Water activities – 5 ECTS
BL5 - Learning II: Technical training and feedback – 4 ECTS
BL6 - The body and martial arts – 4 ECTS
BL 7 - The creative, acrobatic body– 4 ECTS
BL8 - Dance and bodily communication – 5 ECTS
BL9 - Ball games II – the good match-up in net/wall games – 3 ECTS
BL10 - Didactics in sport and exercise – 7 ECTS

Table 1. Course name and ECTS points

The first movement and learning course started in January 2018 with an uptake of 63 students. Three lecturers coordinated and divided the practical and theoretical lectures between them. A research assistant was employed to follow, support and help create coherence between the three lecturers. The course was followed closely by the program responsible [author]. During the course it gradually became clear that the students found it difficult to combine and synthesize the course content and obtain a coherent understanding. The teaching staff understood the students' frustrations and felt that more structure and adjusted content should be offered to bridge the three subsets of course content. Based on both teacher and student experiences, as well as our general interest in progressive learning, we decided to invite a group of students from BL1 to become involved with the planning of the course content, teaching form and examination style for their next learning module (BL5 Learning II). Nine students (8 female and 1 male) accepted the open invitation. The aim of the involvement process was not only to fix the curriculum problems in BL1, but moreover to pursue the following ambitions:

- to develop more current and student informed education programs and make teaching even more fun
- to promote and stimulated increased student responsibility and autonomy in learning processes
- to stimulate early professional (p.e. teacher/programmer) identity formation and leadership among student representatives

Prior to the student involvement it is relevant to present some initial concerns:

- Firstly, staff assumptions and beliefs made us choose a comprehensive degree of student involvement, but is this suitable for year one students transitioning into year two, and how do we interpret and deal with student proposals sensitively?
- Secondly, we use student representatives who propose, and influence decisions based on their interpretation of peer-needs, but do these assumptions hold?
- Thirdly, what happens when the remaining students become obliged to follow decisions made by their peer representatives – do we then get a shared and positive learning culture or do representatives become targeted or marginalized as teacher's pets?

Three bachelor students followed both the student representatives and the whole group. During and after the student involvement process, formal and informal interviews were held with the entire group and individual participants.

The student involvement process

The first meeting was held shortly after the invitation was given and eight students and the program responsible attended. Prior to the meeting, we believed that student involvement should be limited to a couple of pre-course planning meetings. All students stated that they were enthusiastic about having the opportunity to offer their constructive input prior to a course rather than just being asked to evaluate it afterwards. More than half of the students stated that they felt compelled to do so on behalf of the rest of the students. Three of the students shyly expressed that they did not yet know if they could be of any help. During the first meeting information about the entire course structure and the specific BL5 course was given according to the study descriptions (Studieordning for bacheloruddannelsen i idræt og sundhed). Prior to the debate about course content, course form and examination students were informed that an oral exam with an external reviewer was a compulsory element. Stressing for the group that it had been established for mutual benefit of all students, a discussion was raised about how to represent the other students in the best possible way without making the course too easy or difficult. Bearing in mind, that the student group members could risk being misunderstood and unrightfully labelled as teacher's pets, the student group asked to have a discrete role during the BL5 course. Students then called for changes regarding all the parameters that were mentioned as possible to influence:

- Course content – cut away theory and practice about video use, make most possible use of theory from BL1 and other relevant courses, and only add need-to-know theory about feedback and motivation.
- Course form – keep mass class lectures to a minimum and spend more time on dissemination through conferences, include guidance and feedback on need-to-have basis only, and structure peer collaboration and feedback in groups of two.
- Examination – here the students voiced the need for an examination form that could continue the learning process rather become a fragmented or detached system check-point.

During the first meeting a joint decision was made to expand the student-teacher collaboration to last throughout the entire course. This was partly based on the enthusiasm of the students and the desire to evaluate the outcome of the joint decisions. To reach consensus about course content, form and examination another two meetings were held prior to the summer holidays. More meetings would have been necessary if the students were to help re-write the study guide and make a more detailed planning in time for

the august course start. However, this was not possible in the brief time available. Readers, trying to understand the role of staff and students, need to know that our beliefs are that student autonomy only develops if being nurtured through a symmetric and democratic dialogue where decision making is not constantly being overruled by staff. Subsequently, the overall tone during the staff facilitation was directed at creating a positive, informal yet goal-oriented way. To pave the way for a more equal contribution from all students, smaller working groups were organized during meetings, making it easier for to have a say. Additionally, debates were sometimes organized as rounds where everybody would take turns on sharing their opinions, but where the more quiet or shy students would 'incidentally' have the first say. A group communication platform was set up on Facebook to create a more flexible and rapid interaction. During the course, meetings could not be held due to the excess workload of both students and staff, and therefore Facebook and short conversations was often the only source of communication where adjustments to course content and form could take place. It is worth noting that six group members accepted the challenge of writing an abstract prior for an oral presentation at the TAL conference 2018 and three of them were those who originally appeared as shy and careful. After the completion of BL5 and the TAL conference, everybody met again to evaluate the process and the learning outcomes.

The impact of the teaching and learning activity on student learning/engagement?

The voices of student representatives led to a minimization of mass-class confrontation sessions in return for smaller working units and supervision groups. Students had asked for early submission of written products and a more balanced examination process. Based on the general responses and student performances during examinations we believe that most students have learned important skills and gained a significant insight into personal and group learning. The student group abstract presented at the TAL conference revealed that our ambitions to promote increased student responsibility and autonomy in learning processes and early professional (p.e. teacher/programmer) identity formation and leadership had been met. At the conferenced they argued that the collaborative processes had affected their overall motivation to study, improved their self-belief, contributed to their academic learning and finally given them valuable experiences with collaborative work.

Discussion

Initially we raised three important considerations about comprehensive student involvement which is now to be discussed.

1. First, staff assumptions and beliefs made us choose a comprehensive level of student involvement but is this suitable for year one students transitioning into year two, and how do we interpret and deal with student proposals in a sensitive way?
   The student group responded very positively to the invitation of being involved in the process. They all agreed that it had taken much more time and energy than originally expected. Accordingly, it is important that students are presented with a plan for involvement which is clear and limited about number of meetings and tasks. However, they also argued that they learned so much more than expected and they would not have missed any of it. One of the key aspects of their inspiration to take part is directly tied to the genuine nature of our request to get them involved. Thus, it may seem novel, the student group stated that it is important with staff guidance and experience to facilitate the student involvement process.

2. Secondly, we used student representatives who propose, and influence decisions based on student interpretation of peer-needs, but do these assumptions hold?

Before and during the course, the student representatives helped the teaching staff with valuable insights about the peer challenges and difficulties. Accordingly, it was possible to adjust the workload by cancelling a planned student conference. By cancelling the conference, we may have reduced the learning outcome for some while reducing stress for others. In total this was a debatable adjustment. Since the course emphasizes personal and environmental aspect during the learning process, it was possible to purse these motivational aspects under the oral examinations. Here the relevant students stated that more or tougher demands could be a solution when intrinsic motivation is minimal. We did the opposite to help encourage student commitment.

3. Thirdly, what happens when the remaining students become obliged to follow decisions made by their peer representatives – do we then get a shared and positive learning culture or do representatives become targeted or marginalized as teacher's pets? During the first introductory classes we introduced the student representatives. They volunteered to organize group processes and discuss the potential learning expectations among their peers. At first, we believed that this would help the remaining students to realize how they could seek help and exercise their voice if something was not understandable during the course. Interviews with the other students indicated that the role and responsibility of the student representatives were unclear. Some thought they functioned as a sort of instructors and were to play a more active role and one student thought they were more favoured by the teaching staff, thereby causing reduced motivation.

How could our practice be inspirational/transferable to other teachers, students, institutions…?

Too many university teachers complain about students' lack of commitment to read and study without dealing effectively with the underlying causes. Whilst many refinements need to be done, it is our ambition to treat 'shared responsibility and autonomy' as an ongoing capacity building – not only among students – but also among ourselves. We believe that the intentions of finding the appropriate level of student involvement is transferable across the entire teaching profession as well many other helping professions. Within the scope of the current article we wanted to test if it was possible to develop a more current and student informed education program. We believe that the student involvement has been successful and exhilarating to witness. Two thirds of the student representatives took part in the TAL 2018 conference where they argued that the student involvement process had given them a greater insight into the work behind the scenes, increased their sense of responsibility and stimulated identity formation and leadership. We found it valuable to work on a symmetric level with the student panel and make joint decisions, but also had to deal with ongoing doubts about the intermediate role of panel members who stand between us and the rest of the students. Additionally, more work must be done to understand how participation and engagement can trickle down to the students who are not part of the student panel. Students who volunteer as panel members but do not understand the context or the work involved may become further alienated by the work at hand. The positives outweigh the critical concerns, but much more work is needed if student involvement processes are to foster broader student responsibility and autonomy.

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Game Elements in Hospital Clinical Practice: Teaching and Active Learning at the University Hospital of Copenhagen

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Introduction

The education in Biomedical Laboratory Science is a practice-based profession, which consist of periods both at the University College Campus as well as in clinical practice. This way theory and practice are closely connected; the clinical training can bridge theoretical knowledge with skills and vice versa. As biomedical laboratory instructors from two clinical departments we wished to share about our "Spilledage" ("Days with games"), which were the active learning days we conducted with our students from summer 2014 to winter 2017.

Objective

The intent of this project was to have students use game elements as a tool for learning content and to make them reflect on their learning processes. The aim was furthermore to encourage students to use higher order thinking (analysis, synthesis and reflection) relevant to their clinical practice.

Methods

The idea was to create an active learning environment where the students analyze, share and produce knowledge through peer-to-peer and instructor-to-peer feedback. Students phrased a set of questions (figure 1), in a variety of game frameworks, such as online quizzes and board games (table 1). Different frameworks where chosen on one side to accommodate students' different ways of learning and on the other hand to challenge students to progress. The assignments were made using templates in order for the student to focus only on the subject matter of the questions. The subject matter and the level of learning was guided by the learning outcomes of the semester. The strategy was to foster a deeper learning approach through the students constructing knowledge themselves. The assignments were given to work on individually or collaboratively in small groups.

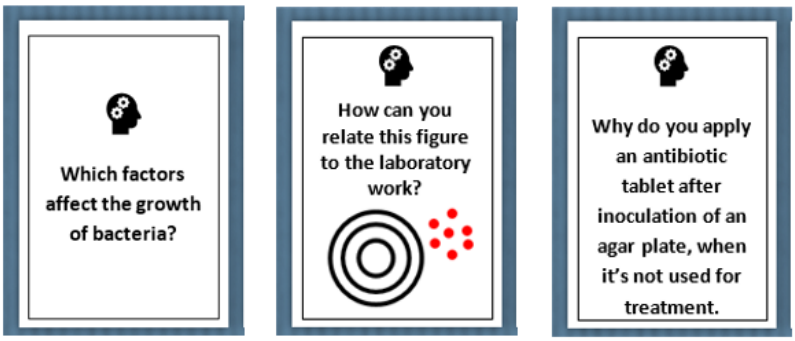

Figure 1: Examples of questions depicted on playing cards.

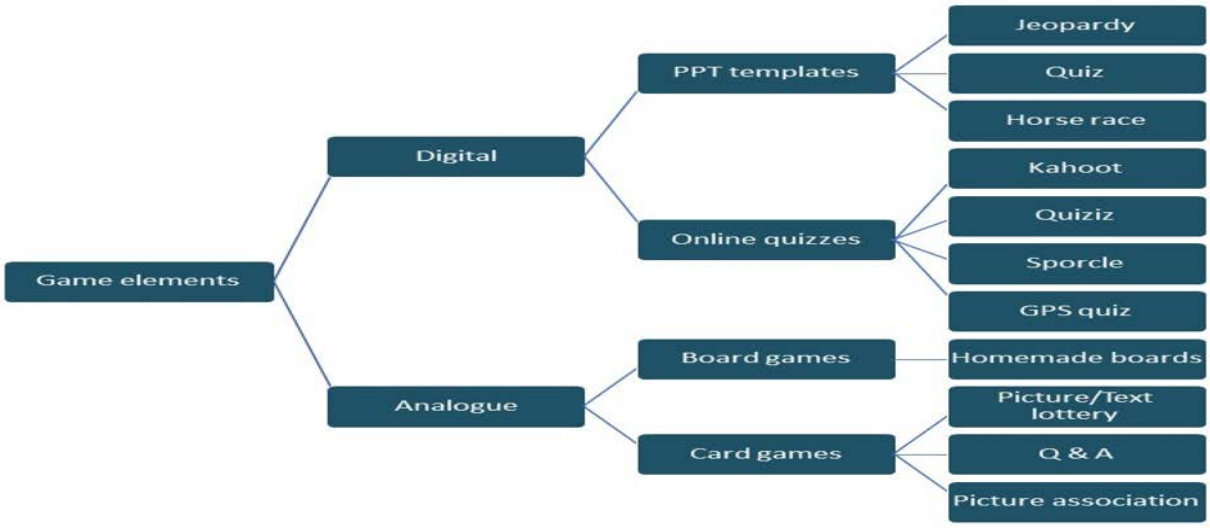

Table 1: overview of the variety of game frameworks.

The role of the instructor was firstly to present the students with the game frameworks. Secondly, the instructor was to act as a general facilitator during the preparation and execution of the games. During the game the instructor helped avoid misunderstandings due to e.g. poorly phrased questions. It was important for the students to experience that the quality of the answer depends on the quality of the question. Furthermore, the instructor was to help students to activate and engage prior knowledge and to self-reflect on their own knowledge by providing feedback during the game.

Results and discussion

Focus group interviews were conducted in two sessions in winter 2017, each lasting 30-45 minutes: a session with three students and a session with two instructors. Focus questions were open ended.

Figure 2: Statements by students categorized into themes.

Figure 3: Statements by Instructors categorized into themes.

We analyzed statements from the interview data (figure 2: students; figure 3: Instructors) in relation to a set of general themes suggested by M. Prensky (2001): learning goals, motivation, feedback and social interaction.

Based on this analysis we found that gamified learning provides:

- a goal driven environment where difficulty increases as students are making progress.
- a competitive and active learning environment that motivates students to participate and encourages them to learn.
- a reflective learning environment where students, through feedback, become aware of their own learning.
- a safe environment with a sense of social relatedness where failure is accepted.

Together these findings point towards gamified learning as a good didactic tool that ultimately supports higher order thinking.

Though learning through games may be highly motivating, there are certain factors one needs to keep in mind. The game must not be too complicated, as you risk students losing the desire to play (Lieberoth, 2017). If students can't understand the purpose of the game or see the goal, they risk losing interest and get frustrated (Chen, 2015).
Regarding effective learning, one must always be aware, that despite motivation, competition elements must not overshadow reflection and discussion (Agger, 2017). For that reason, the teacher is needed to facilitate reflection. Finally, one must be aware that in team play it becomes difficult to keep an eye on the individual performance (Chen, 2015).

Conclusion

Based on our analysis we conclude that using games in teaching can have a highly motivating effect on students. It creates a safe space and fun environment. However, successfully implemented learning games depend on more than just creating a fun competitive environment; the teacher needs to consider the didactic goals and strategies to embed higher order thinking and make students self-reflect on their learning process.

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LINK TO VIDEO

Referencer

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