Ubiquitous Learning and Digital Literacy Practices Connecting Teacher and Learner

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ABSTRACT

I thi   a e , we di cu   digital lite acy a d   e e vice teache educati   a d eflect   the cu e t tate f web-ba ed educati   a d devel   e t f digital lite acy i   teache educati i Sl ve ia. The lite acy c   text i di cu ed i the c text f the Educati al Tech l gy c u e which i delive ed i   teache educati . The ai   f thi c u e f   e e vice e i a y a d   i a y cla   teache i t devel   tude t teache ' digital lite acy a d   e a e the   f the efficie t i teg ati   f ICT i t thei teachi g. Thi will i tu i flue ce lea e ' digital lite acy a d c   ete ce f active e gage e t i the e e gi g cultu e f   a tici ati . The   a e di cu e   web-ba ed teachi g   eth d l gy with a f cu   i t ucti al de ig , lea i g   e u ce a d high- de lea i g utc e . The aff da ce f   bile tech l gy f te   ubi uit u lea i g which ha bee i teg ated i t the teache educati   cu iculu . The   ti   f t l i lea i g a d lite acie i di cu ed i the c text f the   t a iti   f   t aditi al w itte cultu e t   digital cultu e. I i teg ati g   bile lea i g, the e i   ta d i ei c ve ge, u de li i g the devel   e t f digital lite acy: the tech l gy di e i   f wi ele   bile vidi g ta t acce , the cial di e i   a d the lea i g behavi u di e i . A u vey wa c   ducted t exa i e u de g aduate tude t-teache ' attitude the a licati   f ubi uit u educati a d the devel   e t f digital lite acy th ugh the i teg ati   f   bile lea i g. The   e ult i dicate that tude t-teache have devel ed c   ete ce i a va iety f   bile lea i g a d teachi g activitie They believe that   bile tech l gy i c ea e c   ecti   betwee lea e a d teache but a e eut al ab ut the i teg ati   f child e '   cial actice f   thei f ee ti e t ch l e vi   e t.

Keywords
Web lite acy cu iculu , Web educati , "M bile Tech l gy", "Teache "

1. INTRODUCTION
The et f t aditi al lite acie   f w iti g, eadi g a d c   uti g i faci g   hift with the devel   e t f i f   ati   a d c   u icati   tech l gy.

P e e vice teache educati   a d c ti u u   fe i al devel   e t b th face aj cha ge i all d ai a d e ecially i the d ai f teache ' c ete ce .

Due t a id tech l gical devel   e t, the e i di ag ee e t ab ut the c ete ce e ui ed f i teg ati   f ICT i t teachi g a d   fe i al lea i g. I f ati   lite acy kill i cludi g ea chi g, acce i g, c ehe i , c itical evaluati   a d the   i f   e du e f data a d i f   ati [1] have e e ged withi the i f   ati   ciety. C ute lite acy, which i   e c ce ed with c ute tech l gy a d h w t   e ate it [2], wa add e ed by the ele e ta y ch l cu iculu   bjective   the tech l gy,   e ati   f tech l gy, a d tech l gical c ce t a d   g a i g i cludi g   ble   lvi g kill [3]. ICT lite acy efe   t a lyi g i f   ati   c u icati   tech l gy i all a ect f hu a life [4]. ICT lite acy i defi ed a i f   ati   lite acy *"applying technology to communicate and use information resources highlighting critical assessment of information [5]"*. Ubi uit u tech l gy a d a id devel   e t i calli g i t   ue ti the defi iti   f ICT lite acy. Web 2.0 ha b ught a hift f   a i ulati a d c u ti   f i f ati   t   ducti a d ha i g f i f ati [6].

Digital lite acy i defi ed a a ix f tech ical ficie cy a d ea i gful e gage e t i digital e vi   e t [7], web e vi e a d etw k . Digital c ete ce i v lve ble   lvi g, c u icati , a agi g i f ati , c llab ati , c eati a d ha i g f c te t, a d k wledge buildi g [8]. C ete ce f c eative ex e i a d a li e ducti a e e ui ed, b th i ch l a d i the w k e vi   e t [9]. Digital lite acy e ui e c   ete ce f e gage e t i web ba ed e vi e t c bi i g de f e e tati   with ulti le ig y te ex l iti g the aff da ce f web tech l gie a d ulti dal lite acy e bedded i   cial y te [7] a d i e ui ed f aut   u a tici ati   i a etw ked   ciety whe e a tici ati   ea   ducti . Pa tici ati   e ui e the ability t de ig a d c eate ulti dal text a d web e   u ce t   e e t k wledge a d t c u icate with the   [10]

The   ti   f t   l i lea i g [11]   vi g f   the t aditi al w itte cultu e f e cil a d a e tech l gy t digital tech l gy i challe gi g f c g iti a d lea i g. B th i ch l cu icula a d ut f ch l, the ge e f b th text a d i te e al i te acti   c u icati a e igati g f   i t f t digital f . Thi i v lve   e gi g cha acte i tic f al

c   u icati   a d w itte   c   u icati   al g with ulti edia
a d ulti dal aff da ce. Multi   dal lite acy e ui e that [12]
*"The use of different modes of expression in student work should
be integrated into the overall literacy goals of the curriculum…".*
The   ai e ui e et i   ble   lvi g a d c itical thi ki g
ability i all digital e vi   e t a d a lyi g a va iety f   de f
ex e i . Multi dal lite acy ake a ig ifica t c t ibuti t
the c ehe i f c ce t a d t thei a licati th ugh
  cedu al k wledge [12]. F   the tech l gical a gle,
i teg ati f va i u de (cha el) i a i gle
c   u icati al act u i g the a e t c l i c e tualized a
  ulti dality. Multi dality i a lied i e al
c   u icati a d al i hu a -c ute i te acti (e. g.
  ulti dal i te face) [13]. Multi   dal lite acy the ef e
i teg ate u de ta di g a d a i ulati with tech l gy i
te f u de ta di g ulti dal y te a d duci g a d
t a fe i g ulti dal duct i c   u icati act f all
  t .

I i teg ati g   bile lea i g th e i ta t di e i
c ve ge, u de li i g the devel e t f digital lite acy: the
tech l gy di e i f wi ele   bile vidi g acce , the
  cial di e i a d the lea i g behavi di e i .
T a f i g lite acy f   al t witte cultu e [14] i v lve a
  hift i c g iti . Digital lite acy a d   bile tech l gy
aff da ce have i act c g iti . Ma i ulati with   bile
device i cha acte ized by:

- t uch i te acti
- i ta t acce t i f ati
- hy e c ectivity a d etw ki g
- dy a ic i te active a d ulti dal e e e tati facilitati g
  atial awa e e a d ulti dal c   u icati .

M bile tech l gy affect   cial actice f tude t a d h w
  tude t lea ubi uit u ly i day-t -day activitie . Sh t lea i g
eve t a e ty ical a d ultita ki g i c   . A a e bec i g
wide- ead lea i g e u ce [15]. Lite acy i c ate
tech ical kill a d   cial actice which i te act a d i flue ce
each the . Ubi uit u tech l gy facilitate ew cial actice
a d b th lead a d et the lite acy e ui e e t.

Si ce ubi uit u   bile tech l gy t a f cial actice a d
  efe e ce f y u g ge e ati , the teacher ha t c ide
teachi g a d lea i g a a ache alig ed with efe e ce f
  tude t a d digital lite acy *"grammar and spelling of the digital
[16]".* Thi a e di cu e tude t-teacher' digital lite acy,
  utli i g the cu iculu a d a a ache a lied i i itial teacher
educati . The tudy e e t u de g aduate tude t-teacher'
attitude t wa d a lyi g ubi uit u educati a d devel i g
digital lite acy th ugh the i teg ati f   bile lea i g. The
Educati al Tech l gy c u e f   e e vice e i a y a d
  i a y cla   teache ai t devel   tude t teacher'
c ete ce a d e a e the f the efficie t i teg ati f ICT
i t thei teachi g, which will i tu i flue ce lea e ' digital
c ete ce f active e gage e t i a cultu e f a tici ati .

I 2006, teacher' ICT lite acy i Fi la d wa defi ed with e ect
t edag gical c ete cy a d the u e f ICT t l   th e level .
The fi t i v lve the edag gical u e f ICT a d u e f ba ic
  ftwa e f text editi g a d e ail; the ec d i v lve the e
adva ced edag gical k wledge e ui ed f   de i g a d
devel i g lea i g e u ce a d the thi d i v lve   ulti edia,
di ta ce lea i g y te , etw ki g, ga i g, if ati
  y te f ad i i t ati , ICT u ted e ea ch a d i vati .
Fi i h e ea che i dicated that i 2006 10% f teache achieved
the thi d level f ICT c ete ce [17]. With the devel e t f

Web 2.0 the thi d level ha bec e a ba ic e ui e e t f all
teache . The u e f ICT i teachi g a d lea i g f high de
lea i g utc e i a ed i at c ce . ICT i a lied i
teachi g f exa i i g c ce t, lvi g ble , c eativity a d
i vati [18]. M vi g away f   a e cil a d e tech l gy
t digital tech l gy, tude t eed digital c ete ce a e able
  f thei lite acy. The devel e t f digital c ete ce ha t
take lace i a c -cu icula c text a d acc di g t the
TPACK tech l gy i teg ati   del. The TPACK   del
  vide i teg ati   th e level : tech l gy, edag gy a d
c te t k wledge [19].

2. Digital literacy to facilitate high-order learning objectives: The curriculum structure

C ete ce devel ed withi the Educati al Tech l gy c u e
f   e i a y teacher a d i a y cla   teacher a e
c ected with the bjective f e- ch l a d i a y ch l
cu icula, educati al   ce e a d the i te acti a d
ex e ie ce f which child e lea . The c u e c ve
i f ati a d c   u icati tech l gy a well a edia i
teachi g a d lea i g, u de i ed by c ce t f a tici at y
cultu e, etw ki g, a d c eative ex e i a d ducti ,
u de i ed by c llab ati a d ha i g. C ete ce a e eeded
f   a tici ati i digital cietal edia, a d the ga i
  a tici ati i cau ed e by the lack f c ete ce tha by a
lack f tech l gy [20]. The fi di g f e ea ch diffe e t
educati al level i dicate that y u ge ge e ati wh have
g w u u i g digital tech l gie lack ade uately devel ed
c ete ce f   lie a tici ati . The e a e defi ed a c eative
ex e i , ble lvi g, c llab ati a d ha i g [9]. The u e
  f c ute a d the I te et i a t f the w ld f y u ge le
wh a e ea ly ad te f veltie - e ecially i thei   a e ti e
[21]. S ead a g tude t i fa te tha a g teache [22].
The lack f ICT a licati a d thei alig e t with cu iculu
  bjective t wa d digital lite acy i ai tai ed if teache a e t
digitally lite ate a d lack c ete ce f ICT u ted teachi g
[23]. Web educati teachi g eth d l l gy i clude i t ucti al
de ig a d lea i g e u ce a lyi g   bile tech l gy. They
a e i le e ted i the Educati al Tech l gy cu iculu with
ega d t high- de lea i g bjective . Stude t bec e e gaged
i the f ll wi g activitie : digital t ytelli g a lyi g ulti dal
de ig ,   bile ga e ba ed a a licati , cial etw ki g
  ite , ha i g d cu e t, de ig i g e al web ite a d
de ig i g web ite t u t cla   i t ucti , cla
  a age e t utili i g lea i g a age e t y te , Web 2.0 t l
a d at ba d .

2.1 Survey on student-teachers' attitudes and digital literacy

The TPACK   del wa a lied a the teachi g a ach t vide
a authe tic c text f   tude t-teacher lea i g. The i t ucti al
de ig f   the Educati al Tech l gy c u e i f cu ed
exa i i g f child e ' day-t -day actice whe u i g bile
tech l gy a d web. The le f ch l a d teacher i t i f
  a e t a d child e a d t facilitate digital lite acy a d the
a iate i le e tati f the bile tech l gy i day-t -day
activitie . Lea i g at the tage f ea ly lea i g i ba ed
c eative activitie , wh le b dy ve e t, lay a d c llab ati .
Lea i g i ce ed with c ete   - y b lic e e e tati
  f c ce t . Ma i ulati f c ete hy ical bject a d va i u
  ate ial i c bi ed with vi ual e e e tati . Acc di g t
Piaget [24], child e ' devel e tal level i e- ch l a d
du i g the fi t ie d f i a y ch l i defi ed a the level f

c c ete e ati , a d acc di g t B u e [25] it i ce ed th ugh acti i thi e active tage. The c ute vide a ache a d tech i ue f ex e i a d c eati , lay a d c llab ati a d facilitate vi ualizati a d vi tual e e e tati . K e [26] i t ut that web ba ed lea i g vide efficie t a d effective acce t ulti le de f e e e tati a d the ef e i flue ce thi ki g. The c eati , e e e tati a d c u icati f e a i g i ulti dal [27].

The e ea ch ue ti f the tudy we e: What a e tude t-teache ' digital actice a d attitude t wa d educati al tech l gy? H w tude t-teache a e thei w digital lite acy?

2.2 Methods

A u vey a d e i- t uctu ed g u i te view we e c ducted at the e d f the c u e t i de tify tude t-teache ' attitude ab ut educati al tech l gy a d thei digital lite acy. The i t u e t we e de ig ed ba ed the th ee de f e e ti g i te c ected elati hi TPACK [19], FRAME [28] a d va Dijk [29]. The TPACK del f teache ' c ete ce vide the f a ew k f edag gical k wledge, tech ical k wledge a d c te t k wledge f the di cu i f digital c ete ce . The FRAME del ide tifie th ee ai di e i i bile lea i g: th e f a lea e , f a device a d f the cial c text. Va Dijk i c e ed with digital kill which he e e t withi a ticula c text : ediu elated kill , c te t elated kill a d t ategic kill f a lea e . I u di cu i Va Dijk' del i a lied t exa i i g the lea e withi a cial c text whe e digital lite acy i a lied.
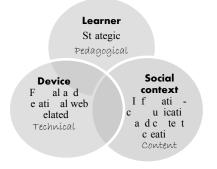

Figure 1. Digital literacy dimensions

The u vey ue ti we e de ig ed i th ee ecti , (1) the lea e / t ategic/ edag gical di e i , (2) the device / f al a d e ati al web elated / tech ical di e i a d (3) the cial c text / i f ati c u icati a d c te t c eati ule / c te t di e i .

The e i- t uctu ed i te view f ll wed the a e t uctu e a the u vey. Pa tici a t we e d aw f tude t-teache f the faculty f educati du i g the yea 2013, 2014 a d 2015. I t tal 117 tude t aged 19-20 yea , 106 fe ale a d 9 ale , a tici ated i the tudy.

2.3 Findings

The fi di g ide tify tude t ' attitude t wa d a d dge e al ue f educati al tech l gy a well a thei ficie cy i b th lea i g a d the i t ucti al ce (i.e. c u e Educati al Tech l gy). Self-a e e t wa c ducted a cale f 5 - ve y high t 1 t at all.

The e ea ch ue ti we e: 'What a e tude t-teache ' digital actice a d attitude t wa d educati al tech l gy?' a d 'H w d tude t-teache a e thei w digital lite acy?'

T add e the fi t e ea ch ue ti , tude t ' bile tech l gy actice we e exa i ed. They we e al a ked t a e thei w ficie cy i b th lea i g a d i t ucti .

T add e the ec d e ea ch ue ti the del e e ted i figu e 1 wa de ig ed. Digital lite acy c i t f ve la i g i te c ected elati hi , which take lace betwee the th ee di e i a i dicated i figu e 1. The bjective wa t exa i e digital lite acy i a c - ecti f tech ical, edag gical a d c te t k wledge. A the e ce e a e c lex, the th ee del we e i teg ated. The lea e di e i c ce the edag gical di e i i a lea i g ce a d t ategic di e i whe i te acti ccu with (a) f al a d e ati al e gage e t with the web (e.g. tech ical) a d (b) i f ati - c u icati tech l gy a d c te t c eati (i. e. cial c text). I the fi t table the tech ical di e i i exa i ed, efe i g t activitie a d elf-a e e t f ficie cy f tude t ' w lea i g a d i t ucti al ability. I the ec d table the lea e t ategic a d edag gical di e i i exa i ed i dicati g ficie cy i lea i g a d i t ucti . The thi d table h w the cial c text f the i f ati al-c u icati al di e i a d c te t c eati a d elf-a e e t f lea i g a d i t ucti .

Table 1. Device / formal and operational web related / technical activities and self-assessment of frequency of general use and level of proficiency for own learning and for instructional use

Activities	Frequency of general use - Mean (SD)	Level of proficiency for own learning – Mean (SD)	Level of proficiency for instructional use – Mean (SD)
Microsoft office / Open Office	5.0	5.0	5.0
Video editing	3.2	1.1	1.0
Photo editing	4.4	2.1	2.2
Web site design	2.7	2.2	2.5
Learning management system	1.9	4.5	3.7
Smart board	1.9	2.2	2.8
Digital storytelling tools	2.4	2.0	3.5
Game based apps application	4.3	3.9	2.2
Social networking sites	4.7	4.5	2.4
Sharing documents	4.9	4.8	4.0
Classroom organisation and management applying mobile technology	4.4	4.4	3.2

Stude t-teache a e ed thei f e ue cy f u e f va i u actice a d tech l gie . S e actice a e a e ed uite high i te f f e ue cy f u e but ficie cy f thei w lea i g a d i t ucti i a e ed uch l we (vide editi g, h t editi g). The e ult i dicate that tude t-teache have devel ed c ete ce i a va iety f bile lea i g a d teachi g activitie . They have a lied the tech l gy i the Educati al Tech l gy c u e i i t ucti al de ig a d acc di gly a e thei level f

ficie cy. They have t, h weve , u ed   e f the e actice (at b a d, digital t ytelli g) f thei w lea i g. F the actice , h weve , ficie cy level a e highe i thei w lea i g a d uch l we f i tucti al u e (lea i g a age e t y te , cla ga izati a d a age e t a lyi g bile tech l gy).

Table 2. Learner/strategic/pedagogical dimension - own learning and for instructional use

Statements	Own learning - Mean (SD)	Instructional use – Mean (SD)
Affordance of mobile technology enhances quality of learning.	4.2	4.1
Teachers should use more mobile learning.	4.7	4.7
I am inclined to use mobile learning.	4.2	4.2
I am confident using mobile technology.	4.5	3.8
I learn about new mobile learning strategies.	3.2	4.4
I discuss mobile technology with colleagues.	1.2	3.3
I enjoy creating multimodal content for mobile learning.	2.2	3.8
My time management is better with mobile technology.	4.3	2.8
I am effective in using mobile technology.	4.5	3.8
I am effective in applying computers for problem solving.	3.5	3.4
I can critically evaluate information on the internet.	4.4	4.4
My competency for creative expression and content production is in general sufficient.	2.9	2.9
Mobile technology encourages learners to get connected more for the purpose of learning in their free time.	2.2	3.0
Interactive tangibles facilitate learning combining representations: tangible, visual and abstract.	4.4	4.4

Stude t-teache i dicate that they feel ve y itive with ega d t bile tech l gy i lea i g a d teachi g. They believe that bile tech l gy ucce fully facilitate lea i g by c bi i g diffe e t e e tati al de . They a e ha y t u e bile lea i g a d a e lea i g e w a ache with bile tech l gy, but i dicated that the la t wa u ed e i i t ucti tha i thei w lea i g. With ega d t di cu i ab ut bile tech l gy a d f digital t ytelli g it i bvi u that thi i e c f i t ucti tha f thei w lea i g. It ee that du i g the Educati al Tech l gy c u e e eff t i dedicated t i t ucti al de ig tha t i le e ti g ew actice i tude t ' w lea i g.

Table 3. Social context / information-communication dimension and content creation / content - own learning and instructional use

Statements	Own learning - Mean (SD)	Instructional use – Mean (SD)
I use mobile technology for collaboration.	4.2	3.6
I am more connected due to mobile technology.	4.5	3.3
I share my learning resources with mobile technology.	4.5	3.6
I participate in professional discussions about mobile technology.	1.1	2.2
Participation in social networks enables me to develop my professional identity.	3.6	3.6
I like content creation in collaboration.	4.2	4.2
I like to search for and share content in groups.	4.1	4.1
In group communication I use multimodal means.	2.7	2.7
Mobile technology connects learner and a teacher so that the interaction between a teacher and learner is more intensive.	4.2	4.2
Mobile technology assisted social practices in free time could be effectively transferred and integrated in school environment.	3.1	3.1

Stude t a e itive ab ut the cial a d c llab ative u e f bile tech l gy i thei w lea i g a d le i i tucti (i te fu i g bile tech l gy f c llab ati , c ected e a d ha i g lea i g e u e). They a e cauti u ab ut whethe cial actice u i g bile tech l gy i child e ' f ee ti e c uld be efficie tly i teg ated i t the ch l e vi e t. They believe that bile tech l gy i cea e c ecti betwee lea e a d teache but a e eut al ab ut the i teg ati f child e ' cial actice f thei f ee ti e t ch l e vi e t.

3. Conclusions

F efficie t ICT i teg ati f u di e i a e c ucial i eve ti g the digital divide: tivati , hy ical acce , digital kill a d diffe e t u age [29]. Ou tudy f cu ed the digital lite acy f e e vice e i a y a d i a y cla teache . The le f the teache i f te i g digital lite acy i the ext ge e ati f tude t h uld be e ha ce thei c ete cy i the d ai f web ba ed lea i g i which digital lite acy i b th a e e ui ite a d a utc e. I the teache educati , the e a ati f e- e vice/ tude t teache ' c ete cy i digital lite acy will be e ha ced by e gi g di e i f tech l gy,

edag gy a d c te t k wledge. The c te   a y e ui e e t
i a ducti a d t a c u ti which e ui e f teache
c eative a d i vative kill i i t ucti al de ig a d delive y.
The devel   e t f digital tech l gy   vidi g ew c text i
which i te acti i ediated by t l, c text a d c te t
(Figu e 1) a d f te ig ati f   i t cultu e t a digital cultu e
defi ed a a ulti dality. The ca ability f   eadi g a d
  duci g ulti dal text eed t be i teg ated i t the
cu iculu . The y u ge ge e ati utili e digital cial actice
which a e by thei atu e ubi uit u a d a uch have a te tial
f i teg ati i t the ch l cu iculu .

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