



*CDTMOOC er verkefni sem er fjármagnað af Framkvæmdastjórn Evrópusambandsins og undir verkefninu sem kallast „Erasmus+ - KA2 - Stefnumótandi samstarf um æðri menntun“.*

*Þetta ritverk endurspeglar skoðanir höfundar eingöngu, og getur Framkvæmdastjórnin ekki verið gerð ábyrg fyrir nokkurri þeirri notkun sem sem kann að verða varðandi innihald ritverksins.*

## Efnisyfirlit

Formáli.....	3
I. Bakgrunnur og yfirlit skýrslunnar .....	5
II. Skilgreining á frumkvöðlun og frumkvöðlamenntun.....	6
III. Markmið og umfang gagnasöfnunarskýrslunnar.....	8
IV. Aðferðafræði .....	9
V. Niðurstöður .....	12
Frumkvöðlun og nýsköpun .....	12
Samstarf háskóa og fyrirtækja .....	<b>Error! Bookmark not defined.</b>
Starfsvalkostir .....	19
Frumkvöðlamenntun framtíðarinnar .....	20
VI. Umræður .....	21
Sjónarhorn fyrirtækisins .....	21
Með kennurunum.....	23
Með nemendunum.....	24
VII. Niðurstöður .....	27
VIII. Viðaukar.....	28
Viðauki 1 – Leiðbeiningar fyrir viðtöl.....	28
Viðauki 2 – Niðurstöður frá Háskólanum í Túrku, Finnland .....	32
Viðauki 3 – Niðurstöður frá EuroNet, Ítalía .....	42
Viðauki 4 – Niðurstöður frá Succubus Interactive Ltd., Frakkland .....	50
Viðauki 5 – Niðurstöður frá Art Square Lab, Lúxemborg.....	58
Viðauki 6 – Niðurstöður frá MSS, Íslandi.....	69
Viðauki 7 – 2019 röðun á DESI, CDTMOOC - samstarfslandanna.....	77
IX. Áhugaverðir tenglar til að skoða .....	79
X. Tilvísanir.....	80

## Formáli

Þessi skýrsla setur fram niðurstöður viðtala við fólk í öllum þáttökulöndum árið 2020 sem tengjast frumkvöðlamenntun og samstarfi við háskóla og fyrirtæki; einnig samstarf við frumkvöðla og fulltrúa SME, kennara og nemendur. Rannsóknin snýst um að finna þá þætti sem hafa áhrif á frumkvöðlastarf og nýsköpunarmenntun.

*Ný alda efnahagsþróunar fer nú um allan heim þar sem frumkvöðlastarf og nýsköpun eru helstu hvatarnir*

---Morris, Kuratko and Cornwall (2013).

Þessi skýrsla hefur einungis verið yfirfarin af höfundum hennar sem eru fulltrúar ýmissa stofnana í Evrópu og verkefnateymisins.

- ✚ Céline Kylänpää, verkefnastjóri, Céline Kylänpää, verkefnastjóri, Svæðisrannsóknir og þróun, deild innan Brahea miðstöðvarinnar við Háskólann í Turku, Finnlandi
- ✚ Vesa Hautala, verkefnastjóri og lektor, Svæðisrannsóknir og þróun, deild innan Brahea miðstöðvarinnar við Háskólann í Turku, Finnlandi
- ✚ Tuomas Ranti, rannsóknarstjóri, Svæðisrannsóknir og þróun, deild innan Brahea miðstöðvarinnar við Háskólann í Turku, Finnlandi
- ✚ Peppino Franco, verkefnahönnuður, stjórnandi og rithöfundur á vegum Evrópu-samstarfs - Sérfræðingur í sköpun – Nýbreytnifræðingur í menntun – Erasmus+ sérfræðingur – EuroNet, Potenza, Ítalíu
- ✚ Magdalena Jakubowska, stjórnandi og miðlari í hönnunarhugsun, Art Square Lab, Lúxemborg
- ✚ Piotr Gawel, þjónustuhönnuður, Art Square Lab, Lúxemborg
- ✚ Laurent Auneau, CEO, Succubus Interactive hf, Nantes, Frakkland
- ✚ Angelo Marco Luccini, hönnuður og UX rannsóknarmaður, Succubus Interactive hf, Nantes, France
- ✚ Nanna Bára Maríasdóttir, fyrirtækjaverkefnastjóri, MSS, Reykjanesbæ, Ísland
- ✚ Hólmfríður Karlsdóttir, verkefnastjóri námsleiða, MSS, Reykjanesbæ, Ísland

## Skammstafanir

CPS	Creative Problem Solving	Skapandi vandamálalausnir
DT	Design Thinking	Hönnunarhugsun
EU	European Union	Evrópusambandið
HEI	Higher Education Institution	Æðri menntastofnun
ICT	Information and Communication Technology	Upplýsinga- og samskiptatækni
IO	Intellectual Output	Vitræn framleiðsla
MOOC	Massive Online Open Course	Opin námskeið á veraldarvefnum
MSS	Miðstöð símenntunar á Suðurnesjum	training centre
SG	Serious Game	Alvarlegur leikur
SMEs	Small and Medium Enterprises	Smáfyrirtæki
UBC	University Business Collaboration	Samstarf háskóla og fyrirtækja
UTU	University of Turku	Háskólinn í Túrku
UX	User Experience	Notendareynsla
VET	Vocational Education and Training	Starfsmenntun og þjálfun

## I. Bakgrunnur og yfirlit skýrslunnar

Verkefnið CDTMOOC hvetur til opinnar menntunar og frumlegra starfshátta á þessum stafrænu tímum með gagnvirkni og leiknámi í MOOC umhverfi, fyrir stór opin netnámskeið, og stafrænum leiðarvísium sem lýsa hvernig þessi nýstárlega aðferðafræði á við í daglegu starfi.

Verkefnið snýst um að brjóta upp námsumhverfið með frumlegum kennsluaðferðum og nota mismunandi aðferðafræði eins og skapandi þrautalausnir, hönnunarhugsun og mannmiðuð hönnun til að styðja við nútíma frumkvöðlastarfsemi. Þetta mun hvetja til breytts vinnulags eftir að gildið kemur í ljós með ítarlegum prófunum.

Samkvæmt Intellectual Output 1 “Evidence Gathering Report” var fjölþrepa rannsókn gerð sem hér segir:

- ✚ Gagnarannsóknir til að sjá hágæða dæmi um menntun sem tengist núverandi **frumkvöðlamenntun og -námi** í Evrópu
- ✚ Viðtöl við viðfangshóp í EU-þátttakendalöndunum fimm – Finnlandi, Ítalíu, Frakklandi, Lúxemborg og Íslandi. Þátttakendur beittu spurningalistum í samtölum (guided interview questionnaires) við viðfangshópinn, m.a. fyrirlesara, nemendur og frumkvöðla. Hver þátttakandi skilaði skýrslu um niðurstöður sínar varðandi frumkvöðlamenntun. Skýrslurnar urðu fimm. UTU hannaði aðferðafræðina og greindi niðurstöðurnar. Rannsóknin fór fram á tímabilinu desember 2019 til maí 2020

Í rannsókninni notðuðu þátttakendur staðlaðan samtalsspurningalista, m.a. opnar spurningar. Spurningalistinn er í Viðauka 1.

## II. Skilgreining á frumkvöðlun og frumkvöðlamenntun

Rétt er að hefja skýrsluna á að skilgreina hugtökin sem koma við sögu verkefnisins og þessarar greiningar:

**Frumkvöðlun** getur skilgreinst sem “hvers konar tilraun til nýs framtaks eða stofnunar nýs fyrirtækis t.d. einyrkjafyrirtækis, nýs viðskiptafyrirtækis eða aukning umfangs starfandi fyrirtækis sem stjórnad er af einstaklingi, teymi einstaklinga, eða rótgróins fyrirtækis”<sup>1</sup>

Markmið **frumkvöðlamenntunar** er að skapa frumkvöðlaviðhorf, sem sagt viðhorf, hæfni og hegðun til að sjá tækifæri fyrir frumkvöðlastarf, afla bjargráða og skapa verðgildi í miðri óvissunni<sup>2</sup>.

En frumkvöðlastarf er miklu meira en að stofna nýtt fyrirtæki. Það er líka fyrirbæri sem hvetur til viðhorfs sem leitar tækifæra, tekur áhættu, sýnir seiglu, nýtir bjargráð og kemur hugmyndum í framkvæmd<sup>3</sup>. Það snýst líka um að skapa ný tækifæri og að framkvæma nýjar hugmyndir í óöruggu og nýju umhverfi<sup>4</sup>. Rúmlega 3.000 háskólar víðsvegar um heiminn bjóða upp á menntun í frumkvöðlafræðum<sup>5</sup> Fjöldi háskóla býður upp á námskeið, vottorð, prófskírteini, meistara- og doktorsnám í frumkvöðlafræðum. Framboð á menntun í frumkvöðlafræðum virðist fara hratt vaxandi og átak hefur verið gert í að ná til háskóladeilda, nemenda og stjórnenda háskóla. Kuratko (2015) segir frumkvöðlanám vera frekar nýja námsgrein sem snýst um stöðuga nýsköpun og sköpunargáfu.

**Leikræna** (gamification) vísar til þess að nota leikinn og leikferli til að vinna með eitthvað sem ekki er leikur. Það hvetur til að læra af því að gera (learning by doing)<sup>6</sup> og innifelur leikhönnun (game design dynamics)<sup>7</sup>, aflfræði (mechanics)<sup>8</sup> og eðlisþætti (elements)<sup>9</sup> <sup>10</sup> sem virkjast inn í verkefni með mismunandi tilgangi, sérstaklega til að virkja og örva nemendur til að afla sér nýrrar hæfni eða breyta hegðunarmunstri sínu<sup>11</sup>, og til að vinna með vandamálalausnir (problem solving)<sup>12</sup>. Þúsaldarfólk (millennials) er tæknifært og flest allt ákafir notendur gagnvirkar miðlunar og leikja á

<sup>1</sup> Reynolds, P. D., Hay, M., & Camp, S. M. (1999). Global Entrepreneurship Monitor: Executive Report. Kaufman Centre for Entrepreneurial Leadership, 3.

<sup>2</sup> Davis, Hall & Mayer, 2016; McGrath & MacMillan, 2000

<sup>3</sup> Kuratko, D.F., Morris, M. H. Examining the future trajectory of entrepreneurship. Journal of Small Business Management (2018) 56 (1), pp. 11-23

<sup>4</sup> Neck and Green 2011

<sup>5</sup> Kuratko 2017

<sup>6</sup> A. I. Diane. Gamification of Entrepreneurship Education. Teaching Brief. Decision Sciences Journal of Innovative Education, Volume 18 Number 2, April 2020

<sup>7</sup> Emotions, Narrative, Constraints, Progression, Relations

<sup>8</sup> Challenging, competing, cooperating, playing in turns, rewarding, providing feedback, relying on chance, acquiring resources, making transactions, reaching win / loss states

<sup>9</sup> Achievements, Avatars, Badges, “Boss fights”, Collections, Combat, Content Unlocking, Gifting, Leader boards, Levels, Performance Graphs, Points, Quests, Social Graph, Teams, Time, Virtual Goods

<sup>10</sup> Deterding et al., 2011; Seaborn & Fels, 2015

<sup>11</sup> Deterding, 2012

<sup>12</sup> Zichermann and Cunningham, 2011, p. 14

netinu<sup>13</sup> og er því opnara fyrir leikrænu (gamification) í tímum og væntir jafnvel eða krefst háþróaðra herma (simulations) til að örva námsáhugann og virknina<sup>14</sup>.

Skref og aðgerðir **vandamálalausna** (CPS) er hægt að flokka í þrennt: 1) skilning á vandamálinu, 2) gagnasöfnun til að fá nýjar hugmyndir og leysa vandamálið, 3) undirbúningur til að bregðast við og framkvæma.

**Hönnunarhugsun** (DT) byggist á þverfaglegri, mannmiðaðri nálgun sem sameinar brottnámshugsun (abductive thinking) sem sveiflast milli greinandi og skapandi rökhugsunar<sup>15</sup>. DT hefur nýlega verið notað sem stuðningstæki við lausn vandamála þar sem hönnun er viðurkennd sem stefnumótandi auðlind<sup>16</sup>. Slíkt krefst skapandi aðferða eins og frásagnaraðferðar, frumgerðar og endurvirkar tilraunastarfsemi.

**Samstarf háskóla og fyrirtækja** (UBC) tengist yfirleitt rannsóknum (tæknimiðlun og nýsköpun), kennslu (símenntun), eða samfélagslegri/menningarlegri þátttöku í samræmi við svæðisbundin þróunarmarkmið. Að auki þá kallar þessi fjölbreytileiki athafna á mismunandi þátttakendur, ýmis svið háskóla og krefst slíkt mismunandi formgerða og samspils til að gera það að veruleika<sup>17</sup>.

---

<sup>13</sup> Hanus & Fox, 2015

<sup>14</sup> El-Masri, Tarhini, Hassouna, & Elyas, 2015

<sup>15</sup> Liedtka, 2015; Martin, 2009

<sup>16</sup> Carlgren, Elmquist et al., 2016

<sup>17</sup> U3M-AL project, Deliverable 1.1. Good practices of 3M in EU universities, Final report, February 2013



### III. Markmið og umfang gagnasöfnunarskýrslunnar

Markmið þessarar skýrslu er að **benda á raunverulegar þarfir og áskoranir varðandi menntun og nám í frumkvöðlun og nýsköpun** í hverju þáttökulandanna: Finnlandi, Frakklandi, Íslandi, Ítalíu og Lúxemborg.

Rannsóknarspurningarnar eru:

- Hverjar eru þarfirnar varðandi menntun í frumkvöðlun og nýsköpun?
- Hvernig er hægt að þróa menntun í frumkvöðlun og nýsköpun í æðri menntastofnunum, sem og nýsköpunarfyrirtæki í tengslum við stafvæðingu?

Rannsóknin skoðar viðhorf helstu aðila innan menntageirans: nemendur, kennara og atvinnugreinina (í þessu tilfalli frumkvöðla og stjórnendur smáfyrirtækja (SME, Small and Medium Enterprises)).

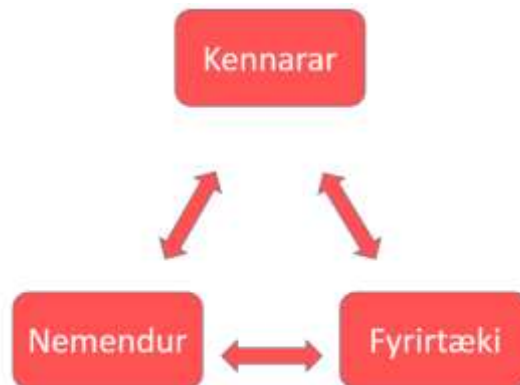
Í rannsókninni er leitast við að sjá hvaða hæfni er mikilvægust til verða frumkvöðull sem og að sjá hvernig stjórnendur menntamála haga samstarfi með sprotafyrirtækjum og smáfyrirtækjum (SME) til að tryggja gildi og gagn menntunarinnar. Sérstaka athygli fær viðhorf nemendanna og greint er viðhorf þeirra til frumkvöðlamenntunar og nýsköpunar í námi þeirra, sem og áform þeirra um að sjá frumkvöðlun sem starfsvettvang; borið saman við viðhorf kennaranna.

Þannig mun greiningin sýna hvort kennsla í frumkvöðlun mæti þörfum nemendanna og væntingum atvinnugreinarinnar. Framtíð frumkvöðlamenntunar frá sjónarhóli hópanna þriggja verður gefinn gaumur.

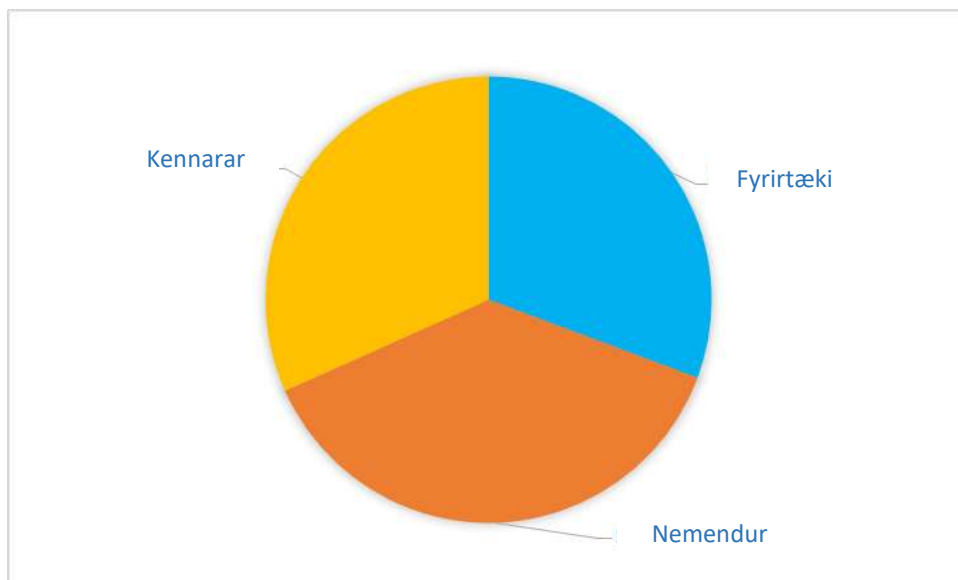
## IV. Aðferðafræði

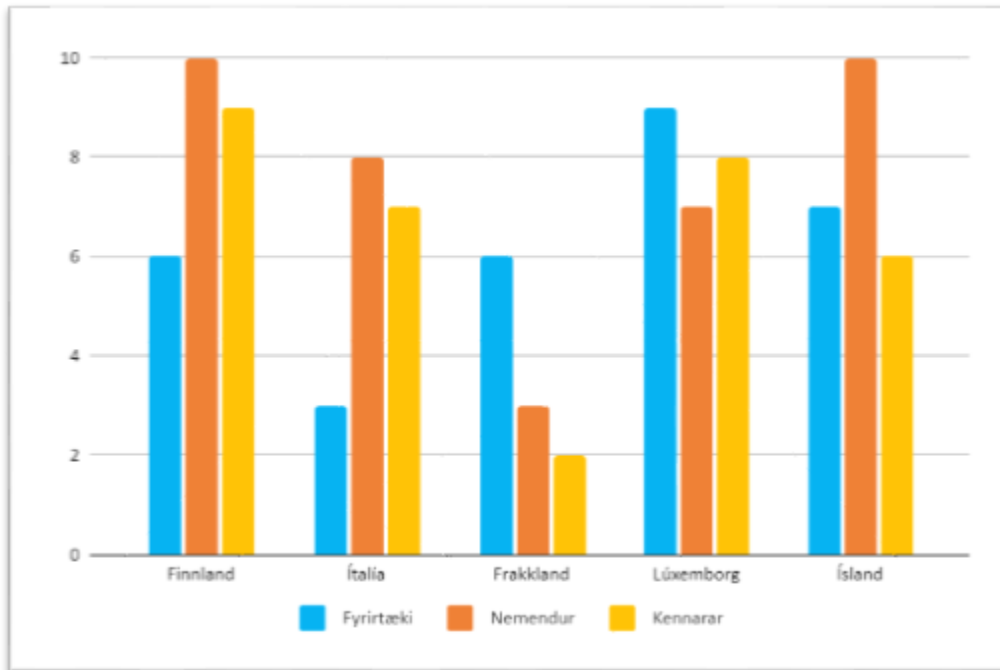
Aðferðafræðin sem stuðst er við í þessari rannsókn byggist á viðtölum við markhópa (focus groups) og svo við einstaklinga úr hlutaðeigandi hópum náms-þríhyrningsins:

- Fræðimenn, prófessorar og kennarar
- SME (smáfyrirtæki) og frumkvöðlar
- Nemendur, aðallega úr æðri námsstofnunum sem og frá starfsmennta- og þjálfunarstofnunum



Viðtöl fóru fram við eftirtalda: 31 frumkvöðul, 38 nemendur og 31 kennara. Samtals 101 utanaðkomandi hagsmunaaðilar.





Rannsóknin fór fram frá nóvember 2019 til júní 2020. Aðferðafræðin sem notuð var kallast óformleg rýnihópaviðtöl. Háskólinn í Túrku leiddi þetta verkefni og samdi spurningar fyrir hvern markhóp (sjá Viðauka 1). Spurningarnar leiddu og stýrðu samtölunum en einnig gátu samræður spunnist út frá þeim. Viðtölin fóru aðallega fram í húsakynnum viðmælenda. Þátttakendur voru valdir samkvæmt hagkvæmni hvað varðaði aðgengi og þörf á mismunandi sjónarhornum: starfsvettvangur, aldur, kyn, þjóðerni o.s.frv. Stærstur hluti rannsóknarinnar fór fram augliti til auglitis en vegna COVID-19 varð erfitt að nálgast viðmælendur og varð því að grípa til símans og netsins.

Grafíkin í skýrslunni er án skala. Niðurstöðurnar voru greindar á eigindlegan hátt og tölurnar tákna ekki fjölda svara heldur mikilvægi svara hvers viðmælenda. Eigindlegar rannsóknir leyfa okkur að skrá hegðunarmynstur og hvatir til að skilja ástæður og undirliggjandi orsakir.

Frumkvöðlun er alls staðar. Á síðustu 40 árum hafa námsbrautir, námsrannsóknir, nemendasamfélög og kennslufræði verið þróuð og útfærð og frumkvöðlun hefur farið að skipta þjóðfélög okkar máli. Frumkvöðlun er miklu meira en að stofna fyrirtæki. Hún hvetur til ákveðins viðhorfs sem leitar tækifæra, tekur áhættu og einkennist af seiglu. En þegar frumkvöðlun verður umfangsmeiri ættum við þá að íhuga hvernig frumkvöðlamenntun gæti litið út? Og það fær okkur til að íhuga hvers vegna frumkvöðlun er kennd. Hvert er innihald frumkvöðlamenntunar? Og hvernig er hún kennd?

Samkvæmt Journal of Small Business Management 2018 og útgáfu þeirra “Examining the Future of Trajectory of Entrepreneurship” þá er frumkvöðlun kennd í háskólum vegna ýmissa ástæðna. Sumir skólar meta sköpun meðan aðrir skoða kraft ferlisins sem krefst ástríðu og orku til að skapa og útfæra nýjar hugmyndir<sup>18</sup>. Innihald breytanna þriggja er mismunandi, blandast oft saman og líta til

<sup>18</sup> Kuratko 2017

1) grunnatriði viðskipta í nýju samhengi rekstrarumhverfis, 2) kjarna innihalds frumkvöðlahugsunar, 3) frumkvöðlaviðhorf. Miðlunarleiðin er oft hefðbundin fyrirlestrar, speglaðar skólastofur, netið o.s.frv. En framtíð frumkvöðlamenntunar fer líka eftir námsferlinu sjálfu og prófanir með það sem er háð að miklu leyti framtíð menntunar almennt.

Og svo er málið framtíð frumkvöðlamenntunar. Frumkvöðlamenntun gæti samþættast við aðrar greinar og eiginlega horfið, alla vega ekki orðið eins áberandi og í dag þegar hún er kennd sem aðalgrein eða aukagrein. Frumkvöðlun gæti þróast og orðið fræðilegri og því færst fjær framkvæmdinni. En svo gæti frumkvöðlun eftir breytingar menntunar og stutt við samfélagið og breytt hlutverki háskóla og verið viðurkennd sem verkfæri til eflingar og umbreytinga.

Það sem við erum að finna með þessari rannsókn er hvernig nútíma aðferðir og hugmyndir í tengslum við frumkvöðlun geta hvatt til stofnunar nýrra fyrirtækja en líka aukið afköst þeirra. Í rannsókninni höfum við reynt að koma auga á þarfir frumkvöðla til að efla samkeppnishæfni þeirra og sjá hvernig samstarf við menntastofnanir, gegnum kennarana, mundi vera jákvætt fyrir bæði efnahaginn og vinnuafli framtíðarinnar.

## V. Niðurstöður

Niðurstöðunum hefur verið raðað í fjóra flokka samkvæmt ramma umræðnanna: 1) frumkvöðlun og nýsköpun, 2) Samstarf Háskóla og Viðskiptalífs (UBC), 3) möguleiki á framtíðarstarfi og 4) frukvöðlamenntun framtíðarinnar.

### Frumkvöðlun og nýsköpun

Eins og bent var á að framan þá er skilningur hópa á frumkvöðlun misjafn. Þetta staðfestist í umræðum markhópsins (focus group) þar sem kom fram þörf á að skilgreina first hugtakið frumkvöðlun.

Hér fylgja tvær skilgreiningar á frumkvöðlun samkvæmt sýn kennaranna:

*Hæfileikinn til að leita nýrra tækifæra sem ekki hafa komið fram fyrir, að bjóða kyrrstöðu byrginn, að gera eitthvað nýtt, að vera utan þægindarammans og að sýna samúð.*

Þátttakandi nokkur nefndi þverfaglegar miðstöðvar þar sem frumkvöðlun táknað færni til að sjá nýjar tengingar milli þekkingar, upplýsinga og fólks.

*Frumkvöðull er líka séður sem sá sem er lausnamiðaður, hefur langtímasýn, sem er hugsjónamaður og sem hefur hæfileika til að sjá fyrir sér eitthvað sem er ekki til, eitthvað sem gæti virst vera „klikkað“. Frumkvöðull vísar í hæfileikann til að vera skapandi til að ná markmiðum og láta drauma rætast þrátt fyrir takmörkuð bjargráð. Hann er sambland hugsýnar og sannfæringar (venjulega hefur fólk bara annað til að bera) fyrir eitthvað nýtt. Hann hefur hugarþel, afstöðu, sem sprettur af innra eðli persónunnar í formi frjórrar ímyndunar og skorts á ótta við að taka áhættu.*

Sem sjá má eru báðar þessar skilgreiningar mjög nýsköpunarmiðaðar. Frumkvöðlarnir og nemendurnir gætu haft aðra sýn á eðli frumkvöðlunar eins og bent var á fyrir, að ögrunin við frumkvöðlun er að mismunandi hópar skilgreina hana á mismunandi hátt. Samkvæmt orðabók Merriam-Webster er frumkvöðull sá sem skipuleggur, stjórnar og tekur áhættu í viðskiptum eða framkvæmdum. Þessi síðasta skilgreining lítur líka á einyrkja sem frumkvöðul þó svo að eðli viðskiptanna sé ekki endilega tengt nýsköpun. Skilgreining kennaranna gæti sýnt frumkvöðlun kennda við háskóla vera nýsköpunarmiðaðri og að einhverju leyti þrengri.

## Þróun fyrirtækis

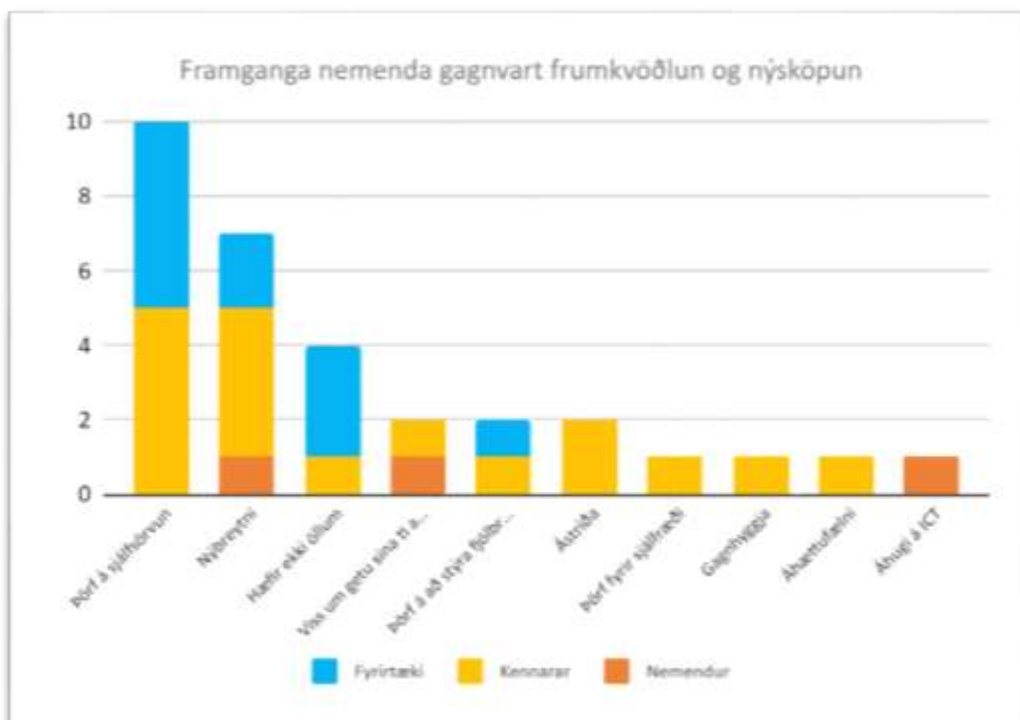
Frumkvöðlar nota nú eftirfarandi leiðir til að auka við þekkingu sína:

- málstofur, ráðstefnur, smiðjur, búðir
- lestur
- netið
- ráða lærlinga
- leiðbeinendur
- læra af eigin reynslu, tilraunastarfsemi
- símenntun: MOOC, nám á netinu, námskeið
- fylgjast með nýsköpunarstefnum í sínum geira og hjá samkeppnisaðilum

Þekkinga er aflað með því að hittast og notast við netið í samskiptum.

Oft sýnir það sig að eigi nýsköpun að þróast þá þarf frumkvöðullinn og starfsmenn að búa yfir sérstakri hæfni, en svo þarf vinnustaðarmenningin að styðja við einstaklinginn til að örva nýsköpun.

## Hæfni nemenda fyrir nýsköpun



Grafið sýnir frumleika nemendanna samkvæmt þeim sjálfum, kennurunum og fyrirtækjunum. Bæði kennararnir og frumkvöðlarnir eru sammála um þörf nemenda á einhverri sjálfsörvun og að stöðuglega þurfi að hvetja þá áfram hvað varðar það sem telst ekki til námseininga. Þeir skilja að

frumkvöðlun er ekki allra en að hægt sé að hvetja til frumkvöðlunar til að sérstaka örva sérstaka hæfni sem góður fyrirtækjarekstur krefst. Þeir eru sammála um að nemendur séu frumlegir og að samstarf við nemendur og yngri kynslóðir skapi nýjar víddir fyrir reksturinn.

Kennararnir álíta nemendur sína frekar áhugasama, hagsýna og áhættufælna.

Nemendur sjá sig líka sem áhugasama um nýbreytni og með góða hæfni til að reka fyrirtæki. Upplýsingatækni (ICT) er álitid tengjast nýsköpun.

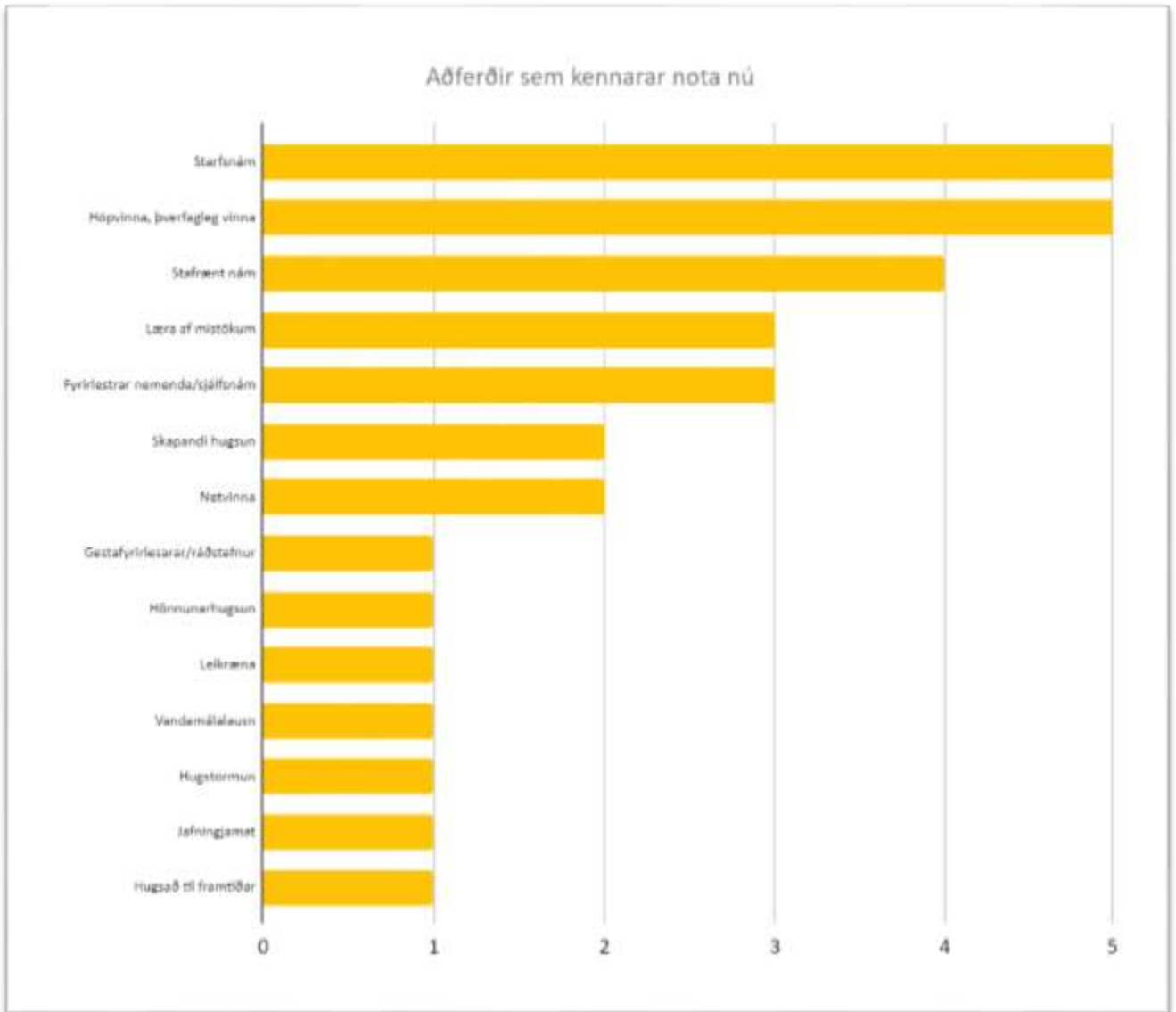
Fyrirtækjafrumkvöðlun (intrapreneurship) var líka nefnt sem valkostur við frumkvöðlun (entrepreneurship). Munurinn á þessu tvennu er að hið fyrra gerist innan rótgróins fyrirtækis eða stofnunar en hið síðara tilheyrir nýju fyrirtæki (sprotafyrirtæki) sem stofnað er með frumkvöðlastarf í huga. Fyrirtækjafrumkvöðull er yfirleitt starfsmaður innan fyrirtækis sem vinnur með hugmyndir sínar þar<sup>19</sup>. Til að ná árangri sem slíkur þurfa nemendur að hafa til að bera sérstaka hæfni sem hægt er að hlúa að í frumkvöðla- og nýsköpunarnámi.

### *Efling frumkvöðla- og nýsköpunarmenntunar*

Í þessum hluta eru framsettar þær leiðir sem kennarar fara nú til að örva frumkvöðla- og nýsköpunar hegðun í kennslustofunni (grafið „Leiðir sem kennarar nota nú“) og aðferðir sem nemendur og kennarar sjá að styðji við frumkvöðlahegðun (grafið „Aðferð sem eflir frumkvöðlarmenntun“).

---

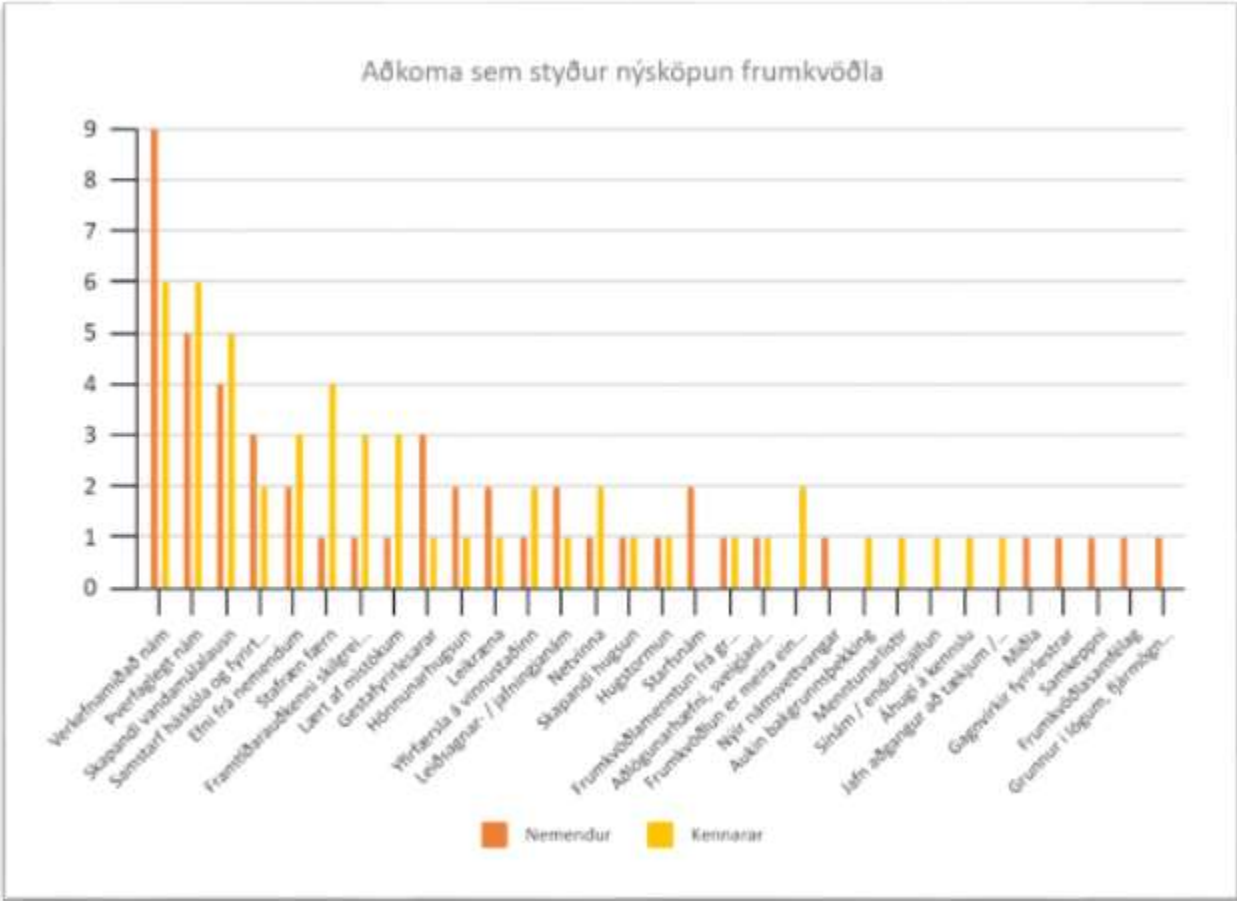
<sup>19</sup> D. Ibrahim, M. Washington, L. Law Review; Intrapreneurship. Lexington Vol. 73, Iss. 4, (Fall 2016): 1741-1793.



Algengustu nýsköpunaraðferðir sem notaðar eru til að efla frumkvöðlun og nýsköpun hjá nemendum eru starfsnám, þverfaglegt nám og teymisvinna, og síðan stafrænt nám. Nám og kennsla sem byggð eru á stafrænu virðast haldast í hendur við nýsköpun. Einnig er áhugavert að sjá kennara hvetja til að læra af mistökum (trial and error) eins og frumkvöðlar hvetja til. Fyrirtæki álitu mikilvægt að læra af mistökum. Skapandi hugsun, hönnunarhugsun og leikræna eru að vissu marki einnig verkfæri í höndum kennara sem passar alveg við verkefni okkar.

Grafið að neðan sýnir lista atriða sem best styðja við frumkvöðla- og nýsköpunarmenntun samkvæmt nemendum og kennurum. Þessi tvö gröf borin saman nýtast einnig við að sjá hvað líkt er með aðferðum kennara og svo þeim sem nemendum finnst að ætti að nota meira.





Samkvæmt nemendum mundi verkefni miðað nám efla best frumkvöðla- og nýsköpunarkennslu, næst kæmu þverfagleg fög. Þetta samræmist vel aðferðir þær sem kennarar nota og undirstrikar niðurstöður fyrra grafs. Nemendur vilja fleiri gestafyrirlestra og að efnið væri meira miðað að vandamálalausnum. Þeir vilja fleiri þverfaglega fyrirlestra sem þeir sjá sem mikilvæga til að skapa tengsl og hæfni til að setja á stofn fyrirtæki að lokum. Þrátt fyrir skoðun fyrirtækjanna varðandi skort nemenda á áhuga meðan starfsþjálfun varði þá virtust nemendurnir meta starfsþjálfun sem leið til að auka þekkingu og nýbreytni.

Grafið sýnir að bæði kennarar og nemendur hallast að námssjálfstæði nemenda og að þeir ákveði innihaldið.

Niðurstöðurnar sýna að nemendur eru vel meðvitaðir um leiðir nýbreytniálgununar og gildi þeirra í rekstri, t.d. skapandi vandamálalausnir, hönnunarhugsun, hugstormun og samkeppni. Efling skapandi hugsunar var eitt markmiða kennaranna og virðist vera til staðar. Nemendur nefndu einnig oft leikrænu og samsvarar enn og aftur aðferðum kennaranna. En nefna ber að nemendur vilja sjá meira leikrænt og stafrænt efni. Kennarar eru einnig mjög hlyntir stafrænni færni til að efla nýbreytni.

Bæði nemendur og kennarar sammælast um að samstarf við fyrirtæki mundi efla kennsluáferðir í frumkvöðla- og nýsköpununarfræði.

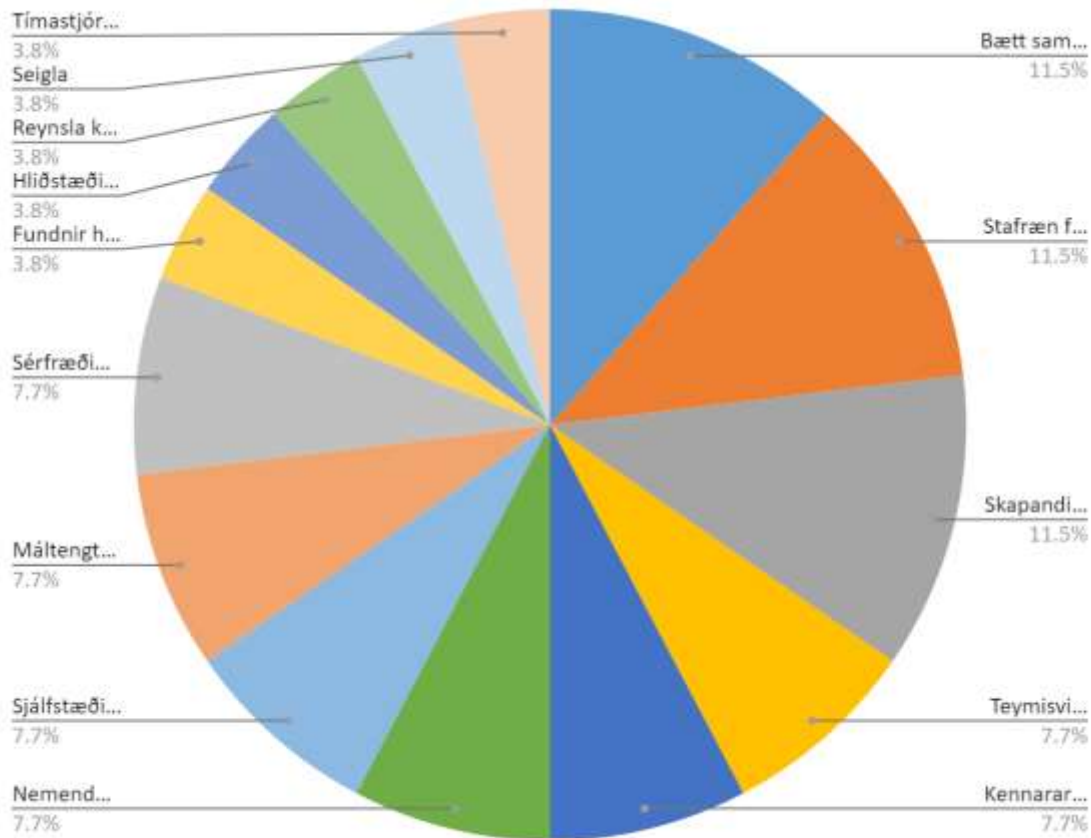
Kennarar nefndu nokkrum sinnum í tengslum við frumkvöðlamenntun að frumkvöðlun og að verða frumkvöðull er ekki allra. Hægt er að kenna frumkvöðlun og efla frumkvöðlafærni en ekki ætti að þrýsta á nemendur til að verða frumkvöðlar. Einnig kom fram í umræðum að fulltrúar fyrirtækja voru sammála um að ættu fyrirtæki að ganga vel þyrftu að vera fjölbreytt þekking og hæfni starfsmanna og að fyrirtækin þurfi á sérfræðingum í sinni grein að halda. Það geta ekki allir verið frumkvöðlar og þarf að velja starfsmenn sem sinna því til að tryggja að rétt færni haldist innan fyrirtækisins og starfsmennirnir séu ekki alltaf á höttunum eftir öðrum tækifærum.

Einnig kom upp nokkrum sinnum að nemendinn þarf að fá leiðsögn í námi til að skynja hvers eðlis hann verður sem framtíðarstarfsmaður og líka til að hjálpa honum skipta úr hlutverki námsmanns í hlutverk starfsmanns. Við útskrift sjá nemendur sig ekki sem atvinnulausa heldur í umbreytingarferli frá nemenda í starfsmann. Nemendur nefndu að bæði skólar og fyrirtæki þyrftu að sjá þennan umbreytingatím frá öðru sjónarhorni til að gefa fyrrverandi nemendum aukin tækifæri til að fóta sig sem starfsmenn t.d. með að koma á tengslaneti, efla sérstaka færni, leiðbeiningakerfi o.fl.

Sumir frumkvöðlanna sem rætt var við útskrifuðust nýlega og margir þeirra nefndu þörf á að í náminu fengju þeir meiri hagnýta þjálfun til að reka fyrirtæki sitt eins og grunnatriði í lögfræði og skattareglum til að auðvelda frumkvöðlinum að verða vinnuveitendur. Þeim fannst það liggja á herðum háskólans sem býður fram frumkvöðlamenntun að veita einnig verkfærin til að spjara sig í hinum praktísku þáttum þess að reka fyrirtæki.

## Samstarf háskóla og fyrirtækja

Eins og fram hefur komið eru kennarar og nemendur hlynntir aukinni samvinnu við fyrirtæki þar sem slíkt er nokkuð algengt í menntageiranum. Frumkvöðlar sem rætt var við eru sammála þessu og bent á leiðir til þróunar.



Frumkvöðlarnir óska eftir betri samskiptum við menntastofnanir. Þeir bentu t.d. að hafa tengilið fyrir bein samskipti í stað einstaklingsbundinna samskipta. Þeir vildu líka að háskólarnir væru í betra sambandi varðandi langtíamarkmið sem myndu hjálpa við að samræma aðgerðir. Einn frumkvöðull nefndi þó að mjög auðvelt væri að ná í prófessora og kennara og að samstarf geti hafist á mjög óformlegan og skjótan hátt.

Þeir óskuðu líka að nemendur hefðu meiri stafræna færni, gætu unnið í teymi og kæmu með skapandi hugsun inn í fyrirtækið. Þeir vildu einnig að nemendur væru sjálfstæðari í starfi, t.d. í starfsþjálfun, þar sem ný fyrirtæki hafa ekki möguleika á að sinna þjálfun lærlinga. Þeir vildu að nemendurnir væru sjálfstæðari og hefðu meira frumkvæði. Þó nokkrir fulltrúar fyrirtækja nefndu vandann við hvata nemendanna þar sem nemendur í mörgum tilfellum eru í starfinu til að fá námseiningar en hafa ekki innri hvöt til að öðlast reynslu eða nýta færni sína. Þetta passar alveg við athugasemdir nemenda varðandi áhuga þeirra og hvernig þeir vildu að námið væri samfelldara og samþættara sem ein tegund verkefnis til að skilja betur hvernig hæfnin sem kennd væri birtist í framkvæmd.

Fyrirtækin nefndu einnig oft að **námsmenningin þyrfti að breytast svo að nemendur óttuðust síður að gera mistök. Nemendur ættu að læra af mistökum og kunna að spretta á fætur eftir að mistakast svo að þeir öðlist meiri seiglu.** Þetta samræmist vel aðferðum kennara við að nýta mistakaleiðina betur.

Sumir nemendur nefndu í tengslum við starfsnámið að þeir væru ekki eins færir og þeir höfðu ætlað, aðallega vegna þess að verkefni sem þeir fengu tengdust ekki náminu. Á hinn bóginn nefndu aðrir nemendur að starfsþjálfun á námstíma væri fínt tækifæri til að fylgjast með, læra um forystu og teymisstjórnun, vandamálalausnir o.fl.

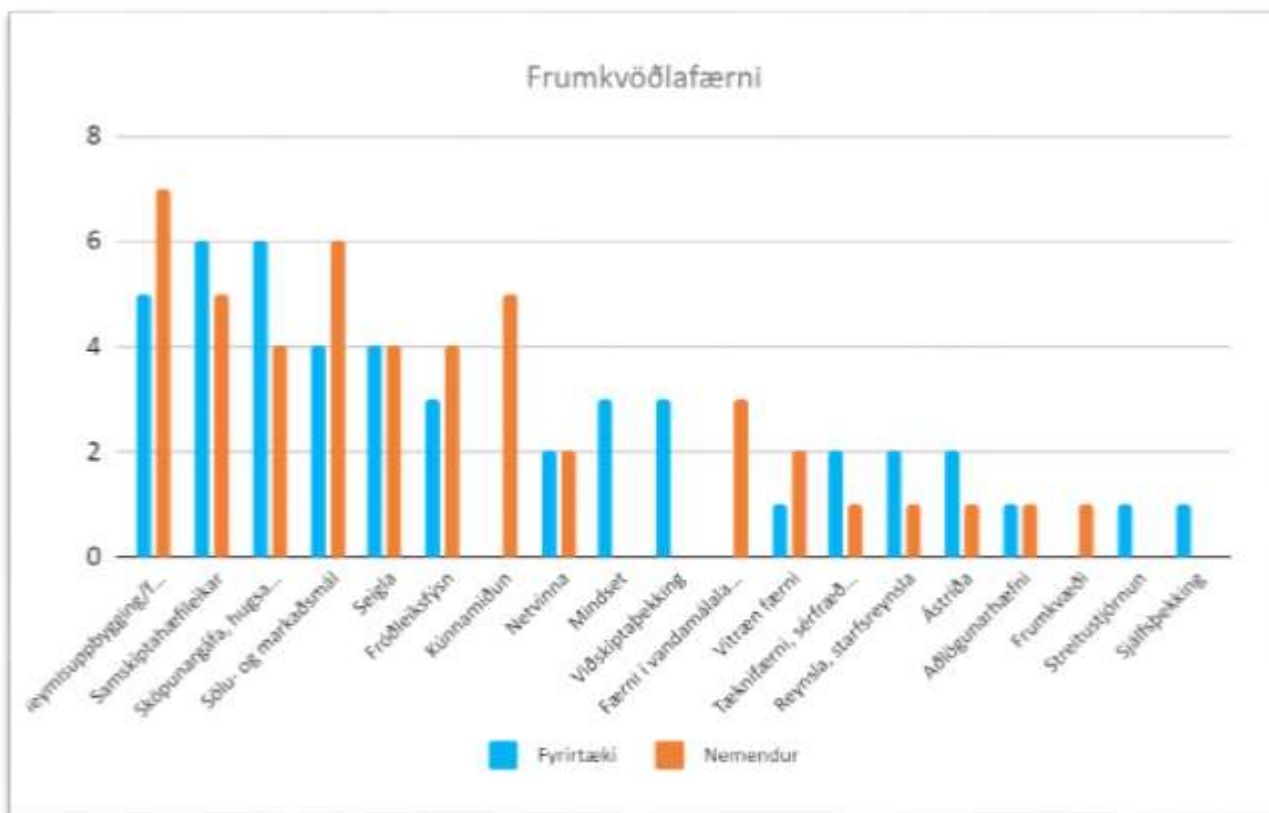
## Starfsvalkostir

### Færni dugandi frumkvöðuls

Í samræðunum voru frumkvöðlar og nemendur beðnir að nefna nauðsynlega færni til að ná árangri sem frumkvöðlar. Í grafinu hér að neðan sjást þeir færniþættir sem fyrirtæki og nemendur nefndu. Þættirnir sem oftast voru nefndir eru táknaðir með hærri súlunum. Svör frumkvöðlanna eru í bláum lit, svör nemendanna í appelsínugulum lit.

Bæði frumkvöðlar og nemendur nefna sem mikilvægustu færniþætti frumkvöðla forystu og stjórnun, samskiptahæfileika, að hugsa út fyrir rammann og fróðleiksfýsni, seiglu, sölu- og markaðshæfileika. **Athyglivert er að sjá að einungis nemendur nefndu þarfir viðskiptavina sem mikilvæga færni en frumkvöðlarnir nefndu það ekki.**

Frumkvöðlar sáu tæknifærni (sérþekkingu), viðhorf og ástríðu sem frekar mikilvæga þætti. Þeir nefndu þó nokkuð oft að streitustjórnun væri nauðsynleg.



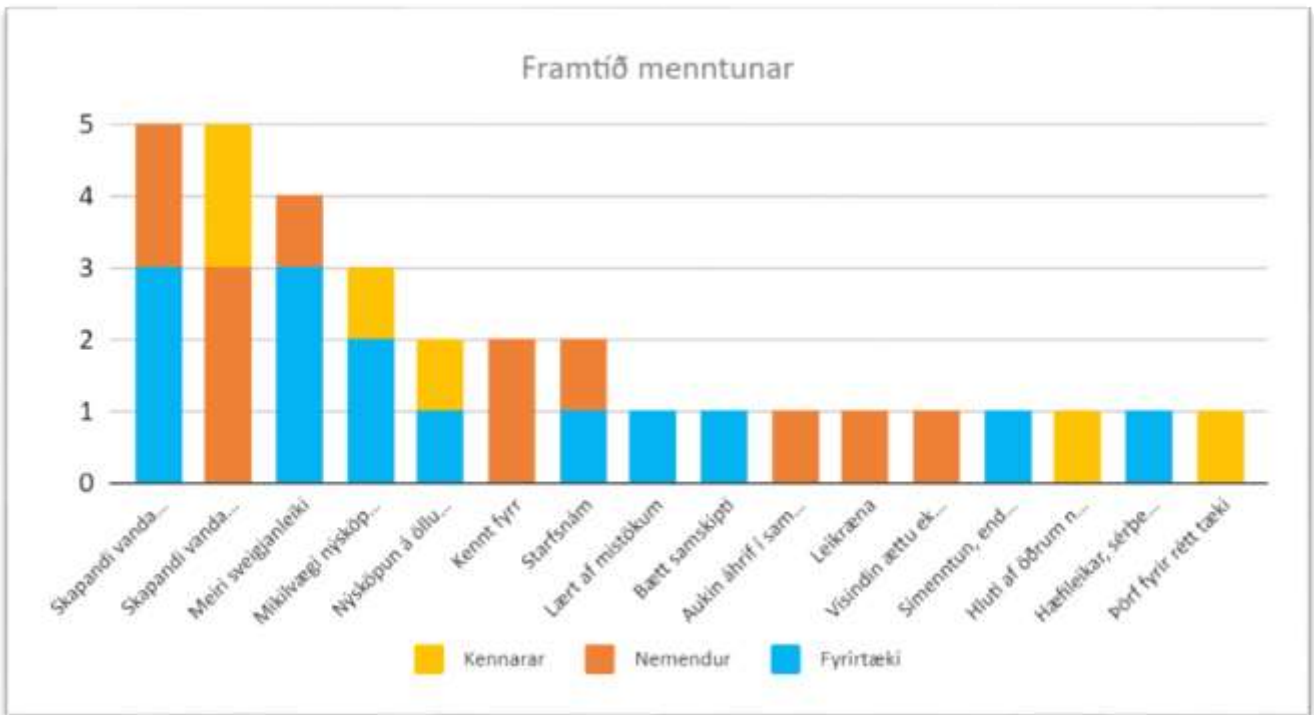
Frumkvöðlamenntun framtíðarinnar

Grafið hér að neðan lýsir sýn frumkvöðla- og nýsbreytnimenntunar á næstu fimm árum.

Nemendur og kennarar eru sammála um að frumkvöðlamenntun og nýsköpun muni bæta kennsluhætti á næstu árum. Áhersla verður á skapandi vandamálalausnir. Menntun verður sveigjanlegri og opnari fyrir mismunandi námsleiðum og –aðferðum.

Nemendurnir vildu að frumkvöðlun yrði kennd fyrr í skóla og yrði hluti af öllum námsstigum. Þeir álitu einnig að hún mundi hafa meiri áhrif á samfélagið. Þeir vænta líka meiri leikrænu í náminu þó kennarar hafi ekki nefnt það.

Kennarar álíta að frumkvöðlamenntun og nýsköpun muni fjölga innkomu nýrra kennsluaðferða sem geta samræmst bættri kennslu. Einnig var nefnt að til að efla nýsköpun þyrftu nemendur að eiga auðveldari aðgang að réttum námstækjum. Þessi athugasemd heyrðist eftir að COVID-19 faraldurinn byrjaði sem þá undirstrikaði þörfina á efni á netinu og aðgang að stafrænu efni.



## VI. Umræður

Púsaldarkynslóðin (fædd 1982-2004) er tæknifær og notar gagnvirka miðlun að miklu marki sem og vídeóleiki á netinu<sup>20</sup> og því væntir hún háþróaðri tækja/aðferð eins og herma í skólastofunni<sup>21</sup>. Leikræna á æðri stigum beinist aðallega að tölvuvísindum, leikjaforritun og verkfræði en hún þróast nú hratt innan viðskipta-, markaðs- og stjórnunarfræða eins og þegar er orðið í stórum hluta í stjórnunarmenntun viðskiptaskóla og fyrirtækjaháskóla. Stafrænar menntunarleiðir eins og MOOC aukast einnig<sup>22</sup> og ekki einungis vegna útfærslumöguleika heldur líka til að mæta síauknum kröfum og verkefnum eins og COVID-19 faraldrinum. Nýlegar uppgötvanir sýna að leikræna eykur samstarfs- og félagslega notkun sem er færni sem nauðsynleg er í frumkvöðlun<sup>23</sup>.

Í þessum hluta munum við ræða niðurstöður til að finna samsvörun við útgefið efni og hvernig þær mundu réttlæta þörfina fyrir leikrænunámskeið til að efla frumkvöðlun og nýsköpun.

### Sjónarhorn fyrirtækisins

#### Færnin

Viðmælendur frá fyrirtækjunum voru mjög sammála því að nýsköpun sé hornsteinn frumkvöðlaævintýrisins, kjarni þess og mikilvægasti þáttur frammi fyrir samkeppni. Fólk var sammála um að helstu áhrif nýsköpunar sé aðgreiningar- og sköpunargáfa.

Viðmælendurnir tjáðu sig líka um þá hæfni sem frumkvöðull þyrfti að búa yfir: auk eigin sérþekkingar þarf frumkvöðullinn að hafa vit á stjórnun, sjóðstreymi og bókhaldi, fjármálum og fjáröflun, markaðs- og sölumálum. En svo er hægt að læra og þróa þessa hæfnipætti með tímanum.

Viðmælendur frá fyrirtækjum lögðu áherslu á gagnsemi **reynslunáms** (learning while doing). Í því samhengi er mikilvægt að spyrjast fyrir og reyna fyrir sér sem og að skilja reynsluna, bæði árangur og mistök. Einnig er mikilvæg færni að nýta sér endurgjöf til að bæta sig, auk samskiptafærni.

Þeir lögðu áherslu á þörfina fyrir alls konar færni, bæði innri og ytri, sem og nauðsyn réttis **viðhorfs**. Þeir sögðu að nemandanum gagnaðist að læra bæði grunnþættina (hard skills) í kennslustofunni en líka færni nýsköpunar. Og þeim mundi gagnast að kynnast flóknum vandamálum í raunheimum og málum sem tengjast **skapandi vandamálalausnum**. Nemendurnir ættu að vera færari í hagnýtum þáttum og vandamálalausnum. Menntakerfið er enn ekki reiðubúið til að undirbúa nemendur sína fyrir raunverulegar þarfir væntanlegra vinnuveitenda.

Fulltrúar fyrirtækjanna benda á hversu flóknara allt er orðið og nauðsyn þess að aðlagast breytingum. Einn sagði: „Enginn veit hvernig framtíðin verður eða hvers konar færni eða þekkingu

<sup>20</sup> Hanus & Fox, 2015

<sup>21</sup> El-Masri, Tarhini, Hassouna, & Elyas, 2015

<sup>22</sup> Dicheva et al., 2015

<sup>23</sup> Antonaci et al., 2015

mun þurfa.“ Þeir lögðu áherslu á að **læra af mistökum** (trial and error), að prófa sig áfram auk þess að leggja áform, og að óttast ekki mistök. Í samhengi menntunarmála gæti þetta verið t.d. „prufuverkefni.“ Mikil þörf er á að mennta nemendur fyrir nýsköpun og frumkvöðlun. **Seigla** og **harðfylgi** eru einnig mikils metin og eru nátengd því að læra af mistökum.

Símenntun er nauðsynleg og þörf fyrir hana eykst með þátttöku í smiðjum, MOOC og hefðbundnum námskeiðum þar sem nauðsynlegt er að vera alltaf opinn fyrir tækninni. Annað gagnlegt er að finna á netinu og með að læra af mistökum. Augljós nauðsyn er á góðri blöndu **faglegrar og eðlislægrar færni** (viðskiptafærni og mannlegri færni, hard and soft skills). Mál sem upp koma munu einnig krefjast þess að ný færni lærist. Þroskastig fyrirtækisins stjórnar líka hvers konar hæfni þróast. Hitt lykilatríði í námsferli og -samsetningu frumkvöðulsins er daglegt starf við frumkvöðlavinnuna.

### *Samstarf Háskóla og Viðskiptalífs*

Þegar rætt er um samstarf háskóla og viðskiptalífs þá leita fyrirtækin eftir **tvíhliða námi**, þ.e. í formi verkefnasamstarfs og samtals milli vísinda og viðskipta. Starfsnám og tímabundið vettvangsstarf eru leiðir fyrir nemendur sem verða mögulega ráðnir til að sanna sig og verða svo teknir um borð. En reynsluleysi nemenda sem koma í starfsnám kallar á þjálfun í tæknilegri grunnfærni og þróun réttra viðbragða líka. Það jákvæða er að þeir koma með **nýja sýn og hugmyndir** sem og **nýjustu fræðilega þekkingu** sem geta styrkt fyrirtækið.

Mikilvægast er að nemendurnir hafi rétt viðhorf til að verða nýir starfsmenn: 1) aðlögunarhæfni, 2) námshæfni, 3) vilja til að þroskast. Venjulega er auðveldara að lynda við starfsnema heldur en við menntastofnanir þar sem markmiðin eru mismunandi: nemandinn leitar raunverulegra tækifæra til að þroskast og prófa sig áfram í raunverulegu starfsumhverfi en menntastofnanir einblína á að koma nemendum fyrir í mismunandi fyrirtækjum til að uppfylla skyldur varðandi starfsþjálfun.

Viðmælendur sáu rof á milli langtíma vandamálalausna háskólanna og skammtíma vandamálalausna fyrirtækjanna. Afleiðingin gæti orðið sú að fyrirtæki gæti orðið ósjálfbært og fallvalt þegar það hugsar einungis um skammtímagróða en vanrækir sýn til framtíðar.

Bent var á þörf fyrir svokallaða kraftmikla sáttasemjara sem þekkja báðar hliðar. Samskipti milli fyrirtækja og menntastofnana eru frekar máttlítil og tilviljanakennd.

Venjulega eru greinar í markaðs- og frumkvöðlafræðum sem viðmælendur meðal frumkvöðla kenna við mismunandi menntastofnanir leið til að ná sambandi við mögulega samstarfsaðila meðal nemenda. Þannig gæti gagnlegt samstarf við menntastofnanir hafist og viðhaldist.

## Framtíðin

Fulltrúar fyrirtækjanna spurðu hvort allir þurfi að læra frumkvöðlun og nýsköpun og hvort við þurfum ekki lengur á „venjulegum starfsmanni“ að halda. Þeir bentu líka á að nýsköpun er ekki nauðsynleg forsenda árangurs í fyrirtækjarekstri og hægt er að bera þetta saman við skilgreiningarnar frammar í þessari skýrslu sem voru byggðar meira á nýsköpun.

Samfélagsstraumar snúast um að áherslan er ekki á varanlegt ævistarf. Því þarf menntun að aðlagast sig þessari þörf með því að einblína á frumkvöðlun og nýsköpun á ákveðinn hátt og með því að styðja nemendur til að þroska með sér áhuga á þessum greinum á tvennan hátt: með því að nemendur taki fullan þátt í langtímaverkefnum, og með þátttöku frumkvöðla í starfsemi menntastofnana.

## Með kennurunum

### Frumkvöðlun og nýsköpun í skólastofnunni

Margir kennaranna sem rætt var við sjá sig gagnvart nemendum frekar sem miðlara og aðstoðarmenn (facilitators) en kennara. Þeir leggja áherslu á að skapa rétt námsumhverfi sem eflir námið. Kennarar ræða frekar um nálganir en nýsköpunarleiðir, -verkfæri.

Kennararnir ræða fjölbreytni og benda á að nemar koma með mismunandi bakgrunn og tilföng og sjá ekki nýsköpunar- eða frumkvöðlahegðun í sama ljósi. Þannig gæti einhver sem ekki virðist vera efni í frumkvöðul samt gegnt lykilhlutverki í rekstrarþróun vegna frumkvöðlalegs viðhorfs. Þörf er á umræðu.

Kennarar meina að virk þátttaka í hlutverkaleik og **tilvikagreiningu** (case analysis) gegni lykilhlutverki í að þróa sköpun og frumkvöðlaviðhorf. Nemendur sýna meiri áhuga þegar kennarar fjalla um raunveruleg tilfelli í kennslunni. Nú er stefnt að slíku í útfærslu í faginu en svo er litið á það sem almennan grunnþátt fyrir framtíðarmenntun (ekki bara í frumkvöðlun) næstu 5-10 ára. Háskólakennarar eru fagmenn sem leitast við að koma á framfæri við nemendur sína viðhorfi vandamálalausna og mannlegri, eðlislægri færni (soft skills). Þeir voru sammála um að þegar nemendum er veitt meira sjálfstæði í námi og vali á innihaldi þess ætti að leyfa meira að **læra af mistökum** (trial and error) til að hvetja þá til að reyna. En svo er mögulegt að meira sjálfræði nemenda í námi minnki hvöt þeirra. Nemendur þarfnast ýtinga og hvatninga og er það oft tilfellið þegar námsefnið er innan ákveðins ramma.

Einnig þarf að rækta og innræta nemendunum sjálfsöryggi, fróðleiksfýsni og sjálfsþroska til að kveikja frumkvöðlaáhuga en líka til að þeir aðlagist betur í síbreytilegu markaðslandslagi. Starfsgreinakennarar kalla á frekari starfsmiðað nám.



### *Þróun eigin færni*

Að koma sér út úr þægindarammanum er grunnkrafta fyrir kennarana sjálfa til að viðhalda þekkingu sinni og styrkja hana í starfi. Kennurum er ætlað að vera sjálfstæðir í nýsköpunar- og frumkvöðlanámi sínu og eru **stöðugt að leita leiða** til að mynda samband við fyrirtæki.

Einnig er mikilvægt fyrir kennara og nemendur að sækja innblástur úr ýmsum áttum (ráðstefnur, netið, viðburðir, menningarlegt og listrænt efni og svo auðvitað útgefið efni) því að samhengið getur haft mikil áhrif á viðhorf til nýsköpunar og nýrra áskorana.

Almennt séð þarf að gefa gaum sýninni á þarfirnar svo að kennarar nýti sér nýbreytni í námsumhverfinu samkvæmt raunverulegum þörfum varðandi framtíðarstörf og frumkvöðlun.

Sumir viðmælenda nefndu einnig þróun kennsluaðferða sinna í samstarfi við aðra kennara og rannsóknaraðila til að ræða markmið námsleiðanna, innihald, verkefnavinnu o.þ.h.

### *Framtíðin*

Viðmælendur bentu á að framtíðin sé óviss og ekki sé nein uppskrift að kennslu. Því leitast þeir við að „kveikja á rofa nemendanna“ þannig að þeir byrji að spyrja og finni sjálfir svörin.

Kennarar viðurkenna að þeir þurfi að auka samstarf við frumkvöðla til að skilja betur þeirra sýn á viðskiptalífið.

## **Með nemendum**

Sjálfskynjun á eigin frumkvöðlunaráhuga er mismunandi og á viðhorf til nýsköpunar og er þetta háð reynslu og mögulega þroskastigi hjá svo ungu fólki. Báðir þættir mótast mjög af sjálfsörygginu sem nemandinn hefur tamið sér hingað til.

### *Lært að vinna*

Í umræðum varð nemendum tíðrætt um kröfur vinnumarkaðarins. Þeim á til að finnast að bil sé á milli færni sem starfsumhverfi setur og færni og þekkingar sem fæst með námi, og bentu þeir á nám og starf sé mjög aðskilið. Þeim var í mun að leysa þennan mismun og nefndu fjölda leiða til þess. Þessir nemendur virtust hafa góða hugmynd um mögulegar nýsköpunarleiðir.

Nemendurnir bentu á að þeir þurfi að læra alls konar færni, alveg frá grunnfærni. Til að gera þetta geta þeir nýtt sér ýmis úrræði: sjálfboðastarf, starfsráðningar, netið... Þá langar mikið að sjá í námi

sínu verkefnaðið viðfangsefni, vandamálalausnir, raunveruleg og gagnleg lífsvandamál, þverfaglegar greinar. Einnig kölluðu þeir eftir samstarfi milli starfsfólks skólanna.

Nemendum fannst að margvísleg færni væri nauðsynleg til að verða góður frumkvöðull. Góð blanda stjórnunar- (efling og valddreifing, stefnumörkun, gæði) og viðskiptalegrar hæfni þarf nauðsynlega að kallast á við pottþétta mjúka færni (samstarf, netvinna, samskipti, teymisbygging, samræður, forysta) og viðhorf (ákveðni). En sérstaklega eru tvenns konar viðhorf sem gera gæfumuninn: fróðleiksfýsn og þjónustulund. Hið fyrra knýr nýsköpun og laðar að rétta samstarfsaðila. Hið síðara knýr árangur rekstrarins.

**Netfærni** og sérhver persónulega starfsreynsla hefur að miklu leyti gert fært að hefja að þróa nauðsynlega færni til að verða frumkvöðular. Sem betur fer varð skólinn okkur út um gott umhverfi handa okkur.

Alvöru leikir og verkefnaðið nám eru vissulega gagnlegar leiðir sem hægt er að útfæra til að taka skrefið fram á við en það sem gerir allan mismuninn til að þróa með sér frumkvöðlahugsun og hæfni er beint samstarf við frumkvöðla. Í því tilfalli mundu smiðjur og ráðstefnur, en helst af öllu leiðbeining (mentoring) og kennsla (tutoring), gera gæfumuninn.

Almennt er framboð nýsköpunar og frumkvöðlunar gott í skólum, en það getur verið misjafnt, sérstaklega hvað varðar nýsköpun í ýmsum tilfellum.

### *Stefnumörkun í starfi*

Nemendur skortir sýn varðandi framtíðarstarf og hafa þeir sterka þörf fyrir að læra af hagnýtu starfsumhverfi.

Nemendurnir leggja áherslu á mikilvægi reynslu og að hafa gott tengslanet áður en að fyrirtæki er stofnað. Mikilvægt er að taka tíma til að þroskast. Þeir nefndu einnig mikilvægi þess að skilja eigin gildi sem fagmanns.

Ljóst er líka að sjálfs-frumkvöðlun er ekki valkostur aðallega vegna þess að sjálfstraust er ekki örvað í hefðbundnu námi. Viðmælendur meðal nemenda sjá ekki nauðsyn þess að verða skammtíma frumkvöðlar. En þetta fer líka eftir námsbrautinni sem þeir eru á: UX hönnuður vill endilega fara að vinna sjálfstætt frekar en nemendur í viðskipta- eða fjölmiðlafræðum sem vilja öðlast reynslu áður en þeir fara að vinna sjálfstætt sem ráðgjafar eða verða frumkvöðlar. En í öllu falli eru kröfurnar sem tengjast frumkvöðlastarfi ígrundaðar og metnar, líka jafnvægi vinnu og einkalífs. Þegar val er á milli þess að leita sér að vinnu eða fara í starfsþjálfun þá er yfirleitt rétt að halda dyrunum opnum, ekki bara til að ná topp sérhæfingu í hæfnipáttum starfsvettvangsins heldur líka til að læra nýja hæfnipætti. En vinnan ætti ekki að vera of fjarlæg grunná hugamálum einstaklingsins.

Almennt séð vilja nemendur að menntastofnanir hjálpi þeim að fylla upp í þekkingareyður sem þeir álíta sig hafa sérstaklega varðandi kjarnagreinar sem geta ekki boðið upp á hæfnipjálfun í öllu sem nemendur þróa. Þeir vilja sérstaklega fá hjálp við að skilja sjálf sig betur til að þekkja eigin styrk og veikleika. Einnig vilja þeir verða færari í samskiptum við aðra sem er lykilatriði frumkvöðulsins. Viðhorfsbreytingar er þörf sérstaklega hvað varðar mistök, að þau sjáist sem tækifæri til að læra

frekar en þrándur í götu. Að lokum, þá er samband við markaðinn og hinn raunverulega viðskiptaheim mikilvægt til að sjá sitt eigið gildi.

Aðalhvatin er þrá til að læra meira og um leið að vera betur undirbúinn og eiga betri möguleika á að sinna fagstarfi. Þekking á starfsgeiranum hefur aðallega hlotist í skólaumhverfinu og svo styrkst við persónulega reynslu.

### *Framtíð menntunar*

Nemendur líta jákvætt á framtíð frumkvöðla- og nýsköpunarmenntunar. Það er mikilvægt hvað varðar ný sprotafyrirtæki og sérstaklega gagnlegt í hátæknigeiranum eins og verkfræði. En svo væri betra að þessir þættir væru kynntir nemendum fyrr á skólagöngunni eins og tilfellið er í öðrum löndum sbr. Svíþjóð (sem notar hlutverkaleik í leik- og grunnskóla).

Engin ein lausn hentar öllum til að bæta frumkvöðla- og nýsköpunarmenntun. Þörf er á blöndu nýrra námsvettvanga, verkefnanáms ásamt meiri þátttöku reyndra frumkvöðla, og framboð á betri hjálpargögnum og leiðum til að ná þessu marki.

## VII. Niðurstöður

Í þessari skýrslu höfum við bent á hæfnipætti, gloppur og framtíðaróskir frá sjónarhóli þriggja hagsmunaaðila í menntunargeiranum: nemendum, kennurum og fulltrúum frumkvöðlunar og nýsköpunar.

Niðurstöður sýna augljóslega að gjá er á milli hæfnipátta sem vinnumarkaðurinn þarfnast og kennslunnar sem nemendur fá. Við mælum með að menntastofnanir leggi meira af mörkum til að hvetja kennara til frekara samstarfi með viðskiptageiranum og að þær bjóði líka kennurum upp á að þróa kennsluhæfni sína. Rétt virðist að beina spjótunum að vandamálalausnum og raunverulegum aðstæðum. Hefðbundin aðferð fyrirlestra í takti við stafræna menntun, studd með leiðum leikrænunnar mundi þróa vissa hæfni hjá nemendum sem kæmu til góða við upphaf starfsferilsins og efla viðhorf frumkvöðlunar. Frumkvöðlamenntun og –fög gætu innifalið líka hæfnipætti frumkvöðlunar og hugarfar tengt henni, og hugsa minna um hjálpargögn og aðferðir til að stofna fyrirtæki þar sem frumkvöðlun er ekki allra, en allir þyrftu að bera skynbragð á frumkvöðlun.

Eftir að COVID-19 faraldurinn skall á vorið 2020 á það enn frekar við í samhengi dagsins í dag að menntun á netinu býður upp á nýja námsmöguleika sem yngri kynslóðin þráir. Leikræna hvetti til þátttöku og samkeppni sem nemendur nefndu sem eina tegund hvatningar til þess að læra og efla frumkvæðislegt hugarfar.

Í rannsókninni kom fram mikilvægi sköpunar og skapandi vandamálalausna sem hvatar fyrir frumkvöðlun og nýsköpun. Einnig sáu nemendur mikilvægi þjónustulundar við viðskiptavininn og að skilja þarfir hans og verða almennt meira neytendahneigð. Einnig kom fram gagnsemi þess að nota skapandi vandamálalausnir og mannmiðaðar hönnunaraðferðir eins og hönnunarhugsun (design thinking) til þess að efla nýsköpunarmöguleika sprotafyrirtækja og fyrirtækja almennt.

Því er næsta eðlilega skref CTMOOC-verkefnisins að fjalla um gjárnar og þróa nýstárlegri aðferðir fyrir kennara og nemendur á æðri menntastigum, og frumkvöðlum, til að svara núverandi þörfum viðskiptalífsins og hvetja almennt til nýsköpunar. CDTMOOC-verkefnið mun horfa til leikræns MOOC sem valkost til að ná þessu markmið.

## VIII. Viðaukar

### Viðauki 1 – Leiðbeiningar fyrir viðtöl

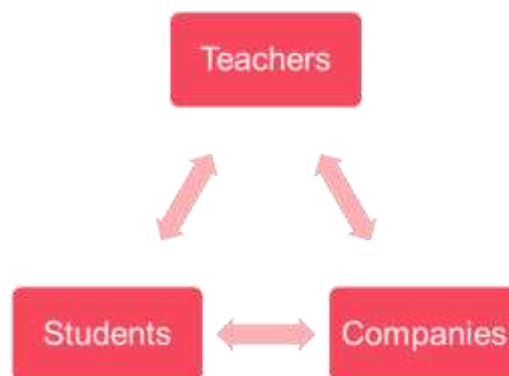
# Focus Group Interview Guide

## Introducing CDTMOOC project and the research

This framework for focus group interview is aiming at **identify the real needs and challenges in terms of education and learning in entrepreneurship and innovation** of each partner country: Finland, Italy, Luxembourg, France and Iceland.

The interviews are focusing on the representatives of the triangle:

- Academics, professors and teachers
- SMEs and entrepreneurs
- and students mainly from higher education institutions but also from Vocational Education and Training Institutions.



From this analysis is emerging the needs and suggestions about the **ways to implement in a more effective way the entrepreneurial education**.

Research method: interviews of teachers, companies and students

The evidence occurred, results and feedbacks with special evidence to the emerging challenges and needs in each partner country from the interviews will be reported by each partner in English. General challenges across the partner countries will be identified and possible ways to implement an effective transformation in the entrepreneurial educational system will emerge. These results will be available under an interactive report in English, Finnish, Italian, French, Icelandic and Luxembourgish and consultable online on ISSUU platform.

Answers are anonymous

---

### **Interview frame to companies**

Based on your experience, what are the skills (soft and hard skills) required to become a successful entrepreneur?

How do you acquire the further skills you need to develop your business?

How does innovation play a role in the development of your business?

When working with students and/or collaborating with education institutions, what skills are you looking for?

What should educators do to make students more entrepreneurial and innovative by the time they graduate?

Which challenges or weaknesses can you identify as a professional in terms of collaboration with education providers / students?

Which threats / demand for change can you identify that have emerged in relation to your cooperation with education providers / students within the last 5 years?

What kind of educational support would you need to ensure your business remains competitive and successful?

In your opinion, what role will entrepreneurship and innovation play in education in the next 5 years? 10 years?

## Interview frame to teachers

How would your students describe your innovativeness and entrepreneurialism in your teaching?

How do you transfer innovative and entrepreneurial mind-set to your students?

What are the newest teaching tools/methods that you use to stay innovative? Can you give an example?

How do you receive feedback on the content and methodology of your teaching?

Within the next 5 years, what will you need to stay innovative and become more entrepreneurial in your teaching?

How entrepreneurial and innovative are your students? How interested are they in these topics?

What are the main challenges you can identify when preparing the students to be entrepreneurial and innovative?

In your opinion, what role will entrepreneurship and innovation play in education in the next 5 years? 10 years?

In an optimal world, what do you think could ensure the best entrepreneurial-oriented and innovative education?

**Interview frame to students**

As a student, what skills do you see are necessary to become a successful entrepreneur?

What skills do you wish that your degree would provide you with to become entrepreneurial and innovative?

What tools/methods (e.g. company cases, flipped classrooms, interactive presentations, etc.) do you wish your teachers would use to become entrepreneurial and innovative?

Would you say that the institution where you are studying is entrepreneurial and innovative? How could it improve?

Do you consider yourself entrepreneurial and innovative? Why?

From where have you gained your knowledge of the industry you are trained for?

Are you considering to become an entrepreneur after graduation, and if yes, can you already identify skills and tools you would need to succeed?

When applying for a job/internship, what do you look for? What type of skills do you want to develop?

In your opinion, what role will entrepreneurship and innovation play in education in the next 5 years?

In an optimal world, what do you think could ensure the best entrepreneurial-oriented and innovative education?



## Viðauki 2 – Niðurstöður frá Háskólanum í Túrku, Finnland

### Outcomes from the group discussions with companies, UTU

---

#### Validity of the results

The companies interviewed were selected based on previous collaboration and recommendations from the SparkUp co-working space. Not all companies have been previously collaborating with the University which gave a wider perspective to the topic. Also interviewees did not all know each other. Companies are operating in different field (consulting agency, quality of air measurement, online education provider, and augmented reality services).

#### BUSINESS DEVELOPMENT

---

##### Skills for entrepreneurs – existing and needed

- Internal skills
  - mind-set (“great ideas are not enough”)
  - stress handling
  - knowing yourself
  - ability to take different perspectives
  - micro skills
  - creativity
  - communications skills
- External skills
  - basic business knowledge
  - sales and marketing skills
- Entrepreneurial mind-set
  - stress on pragmatism
  - Interested on everything
  - handle failure
  - persistence
  - ability to take calculated risks
- Know-how on creating and communicating the business value: differentiation
  - ➔ Ability to deal with complexity in regard to the growing complexity in society
  - ➔ entrepreneurship as dealing with a messy mix of things
- Long-term perspective on doing
  - Continuous learning and not giving up
  - adapting to the change
- Mental capability
  - knowing yourself
  - vulnerability
  - ability to take criticism
  - dealing with conflict

-“you are never ready”

- Good motivation, what are own goals, how to reach them, spilt them in smaller steps
- willingness to learn (mentors, courses at university, online courses, entrepreneurship community)

Additional comments and suggestions:

“Doesn't necessarily need to be innovative, you can be successful without innovation as well.”

“Have time to reflect: collect data, make internal diaries, chats. Working individually and creating partner networks as well.”

## Innovation in the business development

- "Do, notice, reflect, action"
- Looking for interesting things everywhere: seminars, reading, talk with people
- innovation to come up with new solutions

## UNIVERSITY-BUSINESS COLLABORATION

---

### Collaboration with education providers and students

- More communication between universities and businesses
- Lack of visibility => attending events, entrepreneurs are not aware of possible collaboration
- "Lunch with the professor" to learn about the long-term thinking
- “We need "Maverick" teachers who are able to transfer very complex ideas and have gradient between both education and business worlds.”
- Teachers should be exposed to entrepreneurship
- There should be learning both ways
  - ➔ understanding learning
  - ➔ understanding entrepreneurship
- The student needed more skills to work independently as start-up did not have resources to guide the intern
- Skill set of the students is not enough (for programming)

### Students' entrepreneurialism and innovativeness

- students should be pushed to jump
- team work is important to find like-minded people
- going through very innovative cases is inspiring
- more hands on entrepreneurship skills such as tax plan, what has to be considered to protect your company, agreements, etc.
- a more design thinking approach is needed to discuss with end users, the problem has to be validated first
- Should be self-motivation beyond credits
- You shouldn't be afraid of saying something wrong

- “some **basic skills** need to be taught in the classroom, but **practical skills** should be taught right after the hard skills have been developed”
- Attention on diversity: you can be innovative without appearing innovative (e.g. introverted students)
- “University should be a place to **try things differently**, not to go the same wrong way”

Additional comments and suggestions:

“There are 3 types of students.” The ones who:

- > just cruise through the studies (“basic” employees)
- > top students (future managers)
- > out-of-the-box thinkers (innovators)

“Not everyone needs to be the innovator. There’s a threat that the innovator doesn’t work for you a long time, when he discovers something new.”

Suggested tools or approaches for helping students:

**Name of tool/method/approach**

- Capstone approach
- Learning to learn –strategies
- Trying things in different ways
- both the core understanding and creativeness
- Conflict management skills
- Confidence boost –events
- Workshop "How I know how to grab the knowledge while I go"
- Fertilizing a mind-set”, instead of teaching
- “Trial and error”
- Project orientation in teaching
- Solving real world complex problems
- Science parks
- Exposing of teachers to businesses/entrepreneurship
- Learning both ways (understanding learning and understanding business)
- Facilitating entrepreneurship, e.g. by linking students with investors
- Teacher as facilitator
- Creative problem solving
- "Find out" type of tasks
- Creating experiential mind-sets, not only planning mind-sets.
- Finding by yourself

Challenges encountered

- Universities are very good at **long-term problem-solving**,  
Businesses are very good at **short-term problem-solving**
- Dealing with students different than dealing with employees

- Level of **complexity grows** -> you need to be able to **experiment**
- The culture of being afraid to say something wrong
- Pressure for students to graduate faster limit their possibility to take part in such company projects

Additional comments and suggestions:

“Creativeness is not enough, you also need core understanding.”

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

### Educational support needed for business development

- The society coming along -> e.g. basic income
- understanding the value in the future
- Communication between universities and businesses
- Networking skills, team skills
- To be pushed to step out of own comfort zone
- How to run pilots, how to prototype = system to get feedback, how to talk with users
- Branding skills

### Role of entrepreneurship and innovation in education in the next 5 years?

- “Innovation will be very important, more and more people need to be innovative.”
- “Innovation is not a must”
- “The most important is to find the right person to the job”
- Knowing oneself is important to find the core of what you’re doing
  - ➔ “you need to be challenged for that”
- “You cannot just plan, experiment!” -> Learning two mind-sets.
- Courses will be put on value chain and will be integrated and offered as a package
- Students might do a double degree and entrepreneurship will be integrated to economics
- Need for more freedom and flexibility to do what people want
- Will to learn more all the time

## Outcomes from the group discussions with teachers

---

### Validity of the results

The teachers interviewed are all from the University of Turku, but from different faculties: IT, International Business, Language, Dentistry and Entrepreneurship unit. Not all teachers knew each other before the discussion. Not all teachers are familiar with entrepreneurship education or entrepreneurial teaching.

## ENTREPRENEURSHIP AND INNOVATION IN TEACHING

### Innovation in teaching

- Facilitating of learning
- Supportive learning environment
- students finding questions and answers by themselves
- Ensuring teamwork
- Teaching strategic thinking which involves creative thinking
- Future thinking
- “No teaching” -> Flipped classroom
- Do-it-yourself thinking
- "Why" and "how" questions
- Real life case
- Group challenge
- Projects (problem-based learning)
- Settings or approaches rather than tools
- Error and trial
- Inquiry-based learning
- Lectures in video format
- Choice-game / gamification
- Students as producers of lectures
- Action research as tool for the teacher

Additional comments and suggestions:

A teacher pointed out that there are 3 elements of learning:

1. content (theoretical understanding)
2. innovativeness (action to apply their knowledge)
3. reflection (find ways to creating value for organisations and themselves)

### Feedback

- Revisiting and assessing frequently
- Questionnaires with open-ended questions
- Reflections by the students
- “Joint agreement” with expert learners
- Feedback session to get two-way feedback
- Writing a note for next year’s students

## ENTREPRENEURSHIP AND INNOVATION AMONG STUDENTS

---

### Students' entrepreneurialism and innovativeness

- This depends on the learning environment
- Depends also on individual and on the group they are in
- Entrepreneurial attitude not necessarily related to money-making
- Valuing diversity
- students are used to different learning environments
- there are people with different resources
- someone who doesn't seem suitable may play the key role regarding innovation (talent and creativity in the substance)
- dialogue is important

### Challenges encountered

- "Not everyone is suitable to become an entrepreneur, you need employees too."
- Managing diversity
- Entrepreneurial behaviour doesn't look the same for all
- teaching introverted students to give presentations and talk with people
- Role of self-regulation: taking responsibility is easier for others
- Different backgrounds, different background knowledge
- "How to understand people/customers?"

Additional comments and suggestions:

"The attitude has been created already on earlier age."

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

### Role of entrepreneurship and innovation in education in the next 5 years?

- Responding to the growing complexity -> no certainty about the right thing
- Different from context to context and discipline to discipline
- Different perspective needed, not just the hero stories

Additional comments and suggestions:

"Do we also need people who are out of this innovation thinking?" ("basic employees")  
 "What to answer to a 16-year old?" -> how to have a good life? Perhaps: "Try" and "Find out yourself"

### How to ensure the best entrepreneurial-oriented and innovative education

- "Our role is to bring critical creative problem-solvers that can work in teams."
- Creating innovative ways to see things.
- "What will be your desired future?" "We will help you finding out".
- Helping students to transition to the workplace.
- Figuring out their future identity.

## Outcomes from the group discussions with students, UTU

---

### Validity of the results

The results are based on focus group discussion and survey, representing half and half of the answers. The same questions were asked in the survey as in the group discussion.

The participants to the group discussion were approached and selected by the student entrepreneurial community Boost Turku. This implies that all participants were somewhat familiar with entrepreneurship. The participants came from the University of Turku but also the Abo Akademi (Swedish speaking university) and the Turku University of Applied Sciences. The students had different backgrounds. Some came from the business school, others from IT department while some had a sociologist background.

The students who took part in the survey have been enrolled in entrepreneurship courses for non-business students.

## ENTREPRENEURSHIP AND INNOVATION IN STUDIES

---

### Skills for entrepreneurs

- Teambuilding skills
- Negotiating
- Problem-solving skills
- Customer-orientation
- Marketing and sales skills
- Administrative skills
- Experience
- Networking
- Social skills
- cognitive flexibility
- out-of-the-box thinking
- Good knowledge in your own specialization

Additional comments and suggestions:

“The education lacks orientation on problem-solving.”

“The courses on entrepreneurship focus on the practical things and the business idea itself.”

“The courses regarding entrepreneurship are very theory based.”

“The basic course on entrepreneurship for TSE students should be for everyone.”

Ideas for educators: how to acquire needed skills through education

- More orientation on problem-solving
- Multidisciplinary team-working

- Learning how to work over organizational boundaries (with people from different disciplines, organizations, sectors and backgrounds)
- Enhance communication between different faculties
- Developing communication skills in different language systems (like different industries)
- You should push the students to think more by themselves
- Course about the basic things like laws and regulations, funding etc.
- course in innovation related to your subject
- Freedom of choice in tasks and topics

### Suggested tools or approaches for innovation and entrepreneurship learning:

- Design thinking tool (Boost mentioned)
- Double Diamond
- Diversity enhancing
- Interdisciplinary courses
- Work placements
- Work experience
- Real life exposure
- Project orientation
- Hands-on practical courses
- Portfolio type of learning
- Labs
- Games and simulations
- Pitching
- Bootcamps – start-up step-by-step
- global virtual teamwork
- Trial and error
- Maturing (related to trial and error)
- Voluntary work, such as JCI
- resource mobility
- opportunity creation
- Basic business knowledge
- Recognition of the student's value
- understanding your own value when working interdisciplinary
- understanding “hackathons for everybody, not just for business students”
- “nobody told me at the university that my knowledge is valuable”
- Entrepreneurs should come and keep the courses on entrepreneurship
- entrepreneurs coming to class sharing their experiences

### Entrepreneurial institution

- “The studies and working life are very much separated from each other in Finland”
- “There are good plans at the university, but they haven't been applied”
- “could be improved by challenging old habits and encouraging students to think out of the box.”



## ENTREPRENEURSHIP AS A CAREER OPTION

---

### Knowledge of the industry

- The university
- Volunteering
- Knowing the right people
- Work (“studies is a nice add to it”)
- Work placements /internships
- Life in general
- media, literature
- online
- Networking events
- Company projects

Additional comments and suggestions:

“You need job experience to first get a job”

### A career option

- “I have an innovative mind-set, I have these ideas as a hobby and I’m planning to establish a company in the future”
- “I don’t feel entrepreneurial, but team work and brainstorming on classes has made me more oriented”
- “I don’t know if I’m going to be an entrepreneur, but I have good entrepreneurial skills and I’ve been on a start-up booth”

Additional comments and suggestions:

“Usually successful entrepreneurs are 40+ with experience. Students should get to work in companies to get experience and to get to know people to get into the ecosystem of start-ups.”

### Skills through work practice

- soft skills, like presenting yourself
- data management skills
- entrepreneurial skills
- language skills
- connections
- theory into practice
- “is this something for me?”
- continuous skills development
- To develop: expertise on my own field
- judgement and decision making

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

- Bigger role than now
- More well-designed courses
- Easier transition
- Towards problem-solving
- out of failure-thinking
- pushing into entrepreneurial mind-set
- gamification into connection with real life
- project-oriented
- technology will surely mix and speed things up. I feel that academia will have a lot to do in order to keep up -> More openness, more collaboration.

Additional comments and suggestions:

“I guess there will be a greater and greater role for it, but I hope that would not be the biggest goal for the university studies. I appreciate science for its own sake and not just for the business. Innovation is very important too, but I believe you get better business and better society if science can work with its own goals as well without intervening too much. Innovation and science must listen each other as equals.”

### How to ensure the best entrepreneurial-oriented and innovative education

- More co-operation between faculties
- Interdisciplinary courses
- University-business relations
- Student organisations should be more entrepreneurship-oriented
- a system to produce language speaking confidence
- more practical experiences
- To start that from the very beginning of the education (kindergarten, primary school)
- Innovative way of thinking should be skill to use all the time
- Exposing students with “real life”

Additional comments and suggestions:

Not everybody should be or try to be an entrepreneur.

“There should be something that would help to rediscover yourself after graduation

➔ “who am I? Not a student anymore -> unemployed? No! Then what? (help with **Transition identity**)

---

## Viðauki 3 – Niðurstöður frá EuroNet, Ítalía

---

### Outcomes from the group discussions with companies, EuroNet

---

#### The validity of the results

The 2 entrepreneurs interviewed are working in a consultancy company as manager and an entrepreneur active in the handicraft and artistic products (following named as “Artisan”). The entrepreneurs were difficult to be involved and the interviews were planned several times and changed because of their personal engagements in other activities. After the lack of replies in the written form, the interviews were carried out personally face-to-face in an oral way. To facilitate the collection of the results, the survey was translated in Italian and also the replies were provided in the Italian language.

---

#### BUSINESS DEVELOPMENT

---

##### Skills for entrepreneurs – existing and needed

Technical skills are necessary. Management skills are essential to survive in the market.

There is a need to develop soft skills not acquired during formal education about the capacity to deal with complex problems.

The work-based learning is also important because younger students need to analyse and face real difficulties.

For the SME manager, the skills are acquired from continuous and daily learning with the support of national news about legal, fiscal and administrative aspects – the National Order of Fiscal Consultant is providing some e-learning lessons to be attended with a minimum per year (5 topics).

For the artisan, the skills are acquired in using new tools, instruments and in looking on the web about new methodologies and materials.

For both, there are chances for continuous learning offered by the local Chamber of Commerce e.g. seminars for internationalisation or ICT improvements

##### Innovation in the business development

The innovation is considered important but not essential for the artisan that is used to work in traditional contexts, while it is essential for the SME manager operating in a context needing a continuous and daily update of knowledge.

The support would come from the ICT to develop the businesses e.g. as a marketplace for artisan, as innovation for the consultancy for SME manager.

The use of new software should be supported by technical training (e.g. Consultancy software) for all the staff working with it.

Important educational support could come from the Chamber of Commerce or the professional National Orders or National Artisan Confederation, mainly in terms of practical training opportunities or seminars/meeting about relevant topics (internationalisation, networking, collaborations).

## UNIVERSITY-BUSINESS COLLABORATION

---

### Collaboration with education providers and students

No experience for the artisan.

Previous experience for the SME manager as a speaker in a seminar about entrepreneurship at the University of Basilicata. The talks were about the opportunities coming from the regional funds to support the start-ups from a consultancy point of view.

It could be interesting to collaborate for both but for different reasons:

- Use and test of new materials for the artisan
- Supporting the start-ups and new enterprises coming out from student's after the completion of their studies (as potential new customers)

### Challenges encountered

The education is not preparing the students for problem-solving and for real needs. This is affecting the real needs in the enterprises while they are recruiting, they are obliged to train on the job the future workers with a waste of time and resources.

The students should be prepared, in the opinion of the manager to be more independent and conscious about their potential.

### Students' entrepreneurialism and innovativeness

The skills are the confidence, willingness to afford challenges, adaptability, problem-solving.

Usually, the students are not considered for recruitment, only after an onsite training, internship and anyway after detection of their ability and skills.

### Threats and demand for change

The work-based learning experiences should be increased rather than only theoretical learning.

The threats are about the large efforts made in terms of time and resources to train future workers about skills useful in the job. Sometimes, those efforts are vanishing because of the lack of interest/willingness of the students or because he/she is moving to other sectors/activities.

### Suggested tools or approaches for helping students

Help the students to have a more clear vision about their careers and support them with suggestions about the steps to have success.

The innovation is interesting and engaging if it is presented in ways different than the ones included in the books – the training from books should be supported by visual elements and activities where the students feel more active in the training.

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

### Educational support needed for business development

Both are important and they are considered by both entrepreneurs are deeply connected each other.

The innovation mind-sets should be introduced all across the education starting from an early age. The entrepreneurship training should be reinforced in last years of education to prepare the students for future challenges.

## Outcomes from the group discussions with teachers, EuroNet

---

### The validity of the results

The 5 teachers interviewed are from two stakeholders:

- 3 teachers from Studiodomino: a VET provider active both in Vocational Training and master course recognised by the Regional Government in Basilicata
- 2 teachers from Secondary school (lyceum)

The teachers from Studiodomino know each other but they were replying independently to the survey. To facilitate the collection of the results, the survey was translated in Italian and also the replies were provided in the Italian language.

The interviews were carried out in written form for the ones from Studiodomino and in oral form (telephone) with secondary teachers.

## ENTREPRENEURSHIP AND INNOVATION IN TEACHING

### Innovation in teaching

Thanks to a dynamic context, activating the participation in the lessons, investigating together real-cases, stimulating their interest for a more in-depth analysis, let the students choose a part of the topics to be learnt.

Additional comments and suggestions:

the VET teachers are perceiving as most important to let the students to be immersed in real cases, the secondary teachers are more focused on the innovation coming from problem-solving and autonomy in the decision.

Interaction with students thanks to digital tools, looking for the tools the students are using more (e.g. mobile phones, video tutorials). The secondary teachers that have replied in last days, in reality, are struggling with distance-learning with ICT tools – they have detected that the students are ready to use alternative tools e.g. e-learning, video lessons, training modules, online testing etc.

About the methodologies, it is clear for most of the teachers, especially for the ones working for private bodies (ref. Studiodomino), that the use of new tools is not enough to bring innovation in class, it is essential to detect their attention with active participation and by using an informal approach in the language and the attitudes.

Additional comments and suggestions:

The slides, training materials and books are not enough to bring innovation in the method.

## Feedback

The secondary school system is collecting feedbacks via formal oral and written tests – a relevant change is coming this year after COVID-19 pandemic where the lessons are exclusively online and therefore, the teachers are experimenting novel ways to receive feedback from the students (e.g. online tests, video oral tests, online multiple-choice tests).

For VET sector and masterclasses (upper HEI) the feedback is embedded in the lessons with daily feedback from the students in the class.

Additional comments and suggestions:

Some teachers are conscious of their need for coaching skills in order to foster the group cohesion and the active participation of the students

## Innovativeness and entrepreneurialism in teaching

The replies are very different and it depends on the subject and the educational environment.

For some of them is difficult because of the complexity of the subjects, for others is more about the topical aspects in line with real and actual situations.

Additional comments and suggestions:

One of the teachers (in marketing subject) has detected, as essential, the transfer of knowledge about soft skills in a less formal context.

## ENTREPRENEURSHIP AND INNOVATION AMONG STUDENTS

---

### Students' entrepreneurialism and innovativeness

The grades are relatively high (average value 7.5) with lower levels for secondary students and about the innovative attitudes of some students.

### Support from workplace

For secondary school is mainly coming from an autonomous impulse that is evolving, in a more structured but still confused way, in last days because of COVID-19 effect.

The contact with the business is rare and in some cases very intensive masterclasses (upper HEI).

Additional comments and suggestions:

The teachers, especially in formal education, were obliged to be trained, enrich their curricula with ICT knowledge and the use of ICT tools in class.

### Challenges encountered

The main challenge is the motivation for all the teachers.

Once the motivation is ensured, the rest of the process is quite natural.

Additional comments and suggestions:

Usually, the students are non-confident and are resistant to the sacrifices in the learning process, but thanks to alternative e-learning environments the confidence is increasing without relevant problems.

## IO1. Skýrsla um gagnasöfnun

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

### Role of entrepreneurship and innovation in education in the next 5 years?

It is fundamental also over 10 years. The innovation would lose its exceptional characteristic to become ordinary and essential.

It is considered important the topical and updated knowledge about the subject of the teachers.

Additional comments and suggestions:

Some teachers are considering important the use of ICT and networking with enterprises.

### How to ensure the best entrepreneurial-oriented and innovative education

The replies are various as follows:

- more and constant active participation of the students in work-based real cases
- mandatory continuous vocational training also for entrepreneurs
- a structured and daily contact of the entrepreneurs with the educational system

## Outcomes from the group discussions with students, EuroNet

---

### The validity of the results

The 8 students interviewed are from two stakeholders:

- 5 students from Studiodomino: a VET provider active both in Vocational Training and master course recognised by the Regional Government in Basilicata
- 1 student from a VET public school
- 2 students from a Secondary school (lyceum):

The students from Studiodomino are from vocational and masterclasses and they have replied independently to the survey. The same for the VET student, while the 2 students from the secondary school were interviewed during a call conference via Skype.

The students are equally distributed with 4 male and 4 females – the age is going from 18 to 25 years.

To facilitate the collection of the results, the survey was translated in Italian and also the replies were provided in the Italian language.

The interviews were carried out in written form for 6 students and oral form (Skype call conference) with secondary students.

## ENTREPRENEURSHIP AND INNOVATION IN STUDIES

---

### Skills for entrepreneurs

Ability to manage, listen, work in a group, problem-solving, communication, technical knowledge, customer-orientation.

Additional comments and suggestions:

For some of the students, the main skill is rather an attitude: the curiosity.

### Own entrepreneurialism

For most of the students, they consider themselves as innovative and interested in ICT but rarely entrepreneurial (only 2 on 8).

Additional comments and suggestions:

It seems that the students are low confident about their abilities to run an enterprise (especially the younger ones) and they are declaring a need for learning how to be innovative and become entrepreneurs.

### Ideas for educators: how to acquire needed skills through education

The common situations are the school or universities difficulties. An added value is coming from work-based learning, work in group sessions, daily practical issues during the studies (e.g. living alone, struggling with expenses).

Additional comments and suggestions:

It is evident a lack of situations different from the school/university except for one case where the student declared also the importance of sport and activities in an association.

### Needed skills

Management, real cases analysis, ICT, ability to decide, specific and technical competences.

Additional comments and suggestions:

One student has identified the power of the synergies coming from different specific and technical skills among other students/colleagues – it is relevant to become entrepreneurs together.

### Suggested tools or approaches for innovation and entrepreneurship learning:

The tools and methods suggested are various:

- Business cases analysis
- Interactive presentations
- Brainstorming
- Laboratories
- Work-based learning experiences

Additional comments and suggestions:

The need for real cases and engagement in practical business activities is a very important issue.



## Entrepreneurial institution

The students in most cases are declaring that the institutions are innovative and that is more necessary to visit the business and being involved in real cases.

For younger students, the innovation is lower in formal education even if in last days, after COVID-19, there is an important change, even if the school system is not prepared at it.

## Motivation to study

Improve the skills and knowledge to have more chances in the job market, follow the ICT evolution, have a multidisciplinary knowledge.

Additional comments and suggestions:

For one student, it is important the masterclass because it is more advanced than the academic degree and it is coming in a period of her personal lifetime when she feels more mature and conscious about the choices for better employment and career.

## ENTREPRENEURSHIP AS A CAREER OPTION

---

### Knowledge of the industry

After studies at different levels and personal curiosity (only for 2 of them).

### A career option

Almost all the students are not considering the self-entrepreneurship as a possibility at the moment. For some of them, the decision could come only after the completion of studies.

Additional comments and suggestions:

During the face-to-face interviews, it appears that there is an evident lack of vision about the coming future in the job market in a context where the students are insecure about their abilities to face practical issues out of the technical skills acquired during their education.

### Skills through work practice

Professional development, possibilities for a career, autonomy in organizing and managing own work, possibilities to apply creative abilities, human relations.

The skills that would like to be developed are the problem- solving and the work in group attitudes.

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

Role of entrepreneurship and innovation in education in the next 5 years?

Both are considered as essential by all the students, for some of them, entrepreneurship and innovation are deeply connected.

### How to ensure the best entrepreneurial-oriented and innovative education

Ability to have open minded students in an educational context more adaptive to the market needs and able to change itself in a continuously changing environment.

Additional comments and suggestions:

To develop the competencies and abilities for an entrepreneur to have an innovator role, able to introduce novel methods, working process and manage an enterprise continuously looking for.

## Viðauki 4 – Niðurstöður frá Succubus Interactive Ltd., Frakkland

### Outcomes from the group discussions with companies, Succubus

---

#### Validity of the results

The interviewed companies are all dealing mostly with the digital economy at different levels of maturity. However, one of the interviewees is the director of a business incubator, therefore his feedback reflects this larger perspective than the entrepreneurs' one. All of them are based or have started their business in Nantes area and are expanding towards Paris but have larger ambitions.

#### BUSINESS DEVELOPMENT

---

##### Skills for entrepreneurs – existing and needed

- Basic skills
  - ➔ Ability to learn
  - ➔ Curiosity
  - ➔ Own domain technical expertise
  - ➔ Learning from experience (from own mistakes)
- Skills that are necessary but that can be learned over time (**self-development** – MOOC; **practice**; external sources – **networking**, workshops, conferences, etc.)
  - ➔ Management
  - ➔ cash flow
  - ➔ accounting, finance
  - ➔ fund raising
  - ➔ marketing
  - ➔ sales

##### Innovation in the business development

- " That's all we do, we spend all our time generating new products and ideas. "
- "It's a very strong part, you have to be consistent and **differentiate** yourself from your competitors."

#### UNIVERSITY-BUSINESS COLLABORATION

---

##### Collaboration with education providers and students

- **Internship** and use of intermittent workers for testing potential new collaborators among students

- courses in marketing and entrepreneurship at universities and academic institutions, to reach prospect collaborators among the students
- academic institutions need to provide internships to their students in real working environments
- “Yes, historically we have often taken on interns and alternates who we then hire. It's a culture at home, we like it and we're interested in it. I have even taught courses at the CAF.”

### Challenges and opportunities encountered

- students taken on internships **lack of experience** on the field and need to be trained on the core technical skills
- students bring in a **fresh new perspective and ideas** as well as their **up-to-date theoretical expertise**
- students need to have the right **attitude** to become a potential new collaborator: 1) **adaptability**, 2) **ability to learn** and 3) **willingness to grow**.
  - ➔ “Competency number 1 is adaptability, the ability to learn and change. Next comes technical expertise”
- During an internship, students usually look for a real opportunity to improve and test themselves in a real working environment
- However, some of them **lack of motivation** as they just want to satisfy their need of finding an internship.
- Another problem is given by the diverging interests of educational institutions and of companies, since the former just want to **allocate all the students** in different companies for their mandatory internships.
  - ➔ “(educational) Institutions are focused on themselves and their business, they lack the ability to listen to the needs of students and entrepreneurs.”

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

### Educational support needed for business development

- “I think it's working on their long-term vision with long term projects. They need to be involved in projects from A to Z.”
- “a lot of people are already doing business projects, teachers are more often trainers and consultants. What would be nice is to have entrepreneurs give courses.”

### Role of entrepreneurship and innovation in education in the next 5 years?

- “I think it will be 20% of the skills taught. We're going to get people thinking. There will be less salaried work for more entrepreneurship because people will want to work for themselves or on several perimeters.”
- “In my opinion this is fundamental, but there is an entrepreneurial injunction that is developing.”

## Outcomes from the group discussions with teachers, Succubus

---

### Validity of the results

The interviewed teachers come from two different private institutions related to digital technology and arts: E-artsup is a well-established university network across France specialized in digital creativity and multimedia, whilst the Gaming Business School is a brand new school of management specifically addressed to the challenges and professions of video game and e-sport based in Lyon.

Teachers' core academic interests and teaching are particularly different, since one is involved in management techniques, whilst the other is a specialist of a particular design tool. Both teachers are familiar with entrepreneurship education but as a practice in their teaching rather than a specific part of their curricula.

### ENTREPRENEURSHIP AND INNOVATION IN TEACHING

#### Innovation in teaching

- Role playing and use cases analysis to develop creativity and entrepreneurial spirit
  - "I also organize my classes in the form of sprints"
- Knowing what has been done before is as important as what is up today
- Design Thinking, Sprint Design, Agile methodologies and use cases have to be accompanied by general culture sources such as films, games in order to have a holistic view of what has brought us up to today and what are current basis for the future.
- constantly up-to-date, participating to events and conferences and developing own networking capabilities, are absolutely fundamental to be prepared
- The work setting can affect a lot the way one can be exposed to the improvement of own competences and knowledge. The more it offers opportunities to exchange, the more helpful is. However, own engagement and resourcefulness have to be personally sustained.
- Being challenged to test own methodologies and for doing this to develop a network of professional peers and entrepreneurs that can test, review and provide feedback is paramount.

#### Feedback

- Formally: Direct evaluation from students or educational managers.
- Informally, via dialogue and the students' implementation of the principles taught in the classroom.

### ENTREPRENEURSHIP AND INNOVATION AMONG STUDENTS

---

#### Students' entrepreneurialism and innovativeness

- Despite the knowledge of past cases and experiences and the digging into the scientific literature corpus are certainly useful to be informed and aware of lessons learnt, the experimental approach and role playing are certainly more effective in raising interest in entrepreneurship as they leverage onto natural passion for the subject and the need of being independent.
  - “There are 2 variables that affect entrepreneurship: passion and the need for independence.”
- Pragmatism and originality win (whether using role-playing or referring to scientific literature)

### Challenges encountered

- Increase personal self-confidence in order to dare and get out of own comfort zone can be supported better by project-based learning, workshops and self-development.

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

### Role of entrepreneurship and innovation in education in the next 5 years?

- Students will be better prepared to face an ever and more quickly changing market landscape
- New forms of education will emerge as well

### How to ensure the best entrepreneurial-oriented and innovative education

- A better integration in the formal educational activities would be needed:
  - ➔ companies should be more active in the formal education,
  - ➔ students should be invited / allowed to start and bring on simulated and real entrepreneurial endeavours,
  - ➔ students should tap more into resources to increase their background knowledge.

## Outcomes from the group discussions with students, Succubus

---

### Validity of the results

The students contacted for this survey have different levels of experience and follow different curricula at university level varying from a specific technical cursus in UX, to communication, to business administration. Their perception about the subject on entrepreneurship and innovation varies accordingly, from whom that has not experimented a lot and is aware of the need of filling knowledge gaps before daring anything independently, to whom considering herself already innovative but not much interested in starting an

entrepreneurial activity in the short term, up to whom that has already proved oneself on the field and succeeded.

## ENTREPRENEURSHIP AND INNOVATION IN STUDIES

---

### Skills for entrepreneurs

- Management skills
  - ➔ Empowering,
  - ➔ Delegating,
  - ➔ Strategy
- Business skills
  - ➔ Marketing
  - ➔ Sales
- Soft Skills
  - ➔ Collaboration,
  - ➔ Networking,
  - ➔ Communication,
  - ➔ Team building,
  - ➔ Negotiation,
  - ➔ Leadership,
  - ➔ Interpersonal skills,
  - ➔ Organization
- Attitudes / personal qualities
  - ➔ Being rigorous
- Mind-set
  - ➔ Curiosity
  - ➔ Service

### Additional comments and suggestions:

“Have a sense of service because it will impact the network and customers.”

“Organization is also important, knowing how to delegate, having good leadership, knowing how to surround yourself with the right skills to do what I don't know how to do.”

“Curiosity. Knowing how to look for information. This is very important, it allows you to keep an eye on things and to acquire knowledge and experience.”

“The social aspect must also be developed: knowing how to make relationships and play with them. This also requires qualities and interpersonal skills.”

“Being rigorous is also important and intimately linked, it is necessary to know how to work and communicate with people with quality content.”

### Ideas for educators: how to acquire needed skills through education

- Filling up the knowledge gaps they think to have, in particular in relation with their specific curricula that cannot cover all the skills that they identified.
  - ➔ “I have skills in legal and financial management. I'm interested in engineering but it's complicated to acquire as a skill because I'm in business school.”

- ➔ “Having an eye on the market, we are not taught enough to value our skills with companies and to situate our skills and their value on the market.”
- ➔ “To have a different view of failure. I like the American model which shows that failure is not an end but a springboard.”
- ➔ “Self-development, knowing who I am in life, understanding oneself, it allows you to better understand people and life and thus everyone's experiences and ideas.”

### Suggested tools or approaches for innovation and entrepreneurship learning:

- Serious games,
- project-based learning,
- workshops,
- conferences,
- mentoring,
- tutoring
- work placements
- work experience

### Additional comments and suggestions:

“Coaching and advice to develop one's ideas would be interesting, as with the Entrepreneurship Network for example.”

“I would like teachers to organize meetings between entrepreneurs and students, and conferences on entrepreneurship themes.”

“This can also be done through innovative tools such as serious games or interactive works/projects. »

### Entrepreneurial institution

- “I find that my school is receptive and for me this is an innovation because you don't find this in every school. The school could improve in terms of work rhythm (2 days at school, 3 days in the company), but school days are in the middle of the week and this can cut off projects in the company and it blocks the creative and entrepreneurial process.”
- “The institution where I am studying is entrepreneurial and innovative because it helps students through its courses and its various professional interventions to build the knowledge and skills needed for the future as an entrepreneur.”
- “Entrepreneurial yes, innovative not necessarily. It could improve by giving courses on new technologies and new market practices, as well as on accounting.”

## ENTREPRENEURSHIP AS A CAREER OPTION

---

### Knowledge of the industry

- Educational system
  - ➔ Secondary School
  - ➔ University



- Working experiences
- Internships
- Family interests and know-how
- Curiosity (online searches)

### A career option

- It depends on the curriculum
  - ➔ Optional for business / management and communication studies
  - ➔ A natural outcome for professional / vocational studies
- “Yes I want to start freelancing sometime after my degree (3 to 5 years later, less if I have an interesting opportunity).”
- “I lack the management skills to manage my time and my activity.”
- “I would need a personal room, or a dedicated room to concentrate and separate my private and professional life.”
- “Another very important thing is to have some money saved, because you can find yourself without a job overnight as a freelancer, to secure yourself.”
- “I don’t feel entrepreneurial, but team work and brainstorming on classes has made me more oriented”

### Skills through work practice

- Core competences,
- soft skills,
- new skills (in other departments, etc.)
- “I am looking for assignments to develop the skills I am applying for, but also to broaden my knowledge. I wish to develop my business expert skills, my interpersonal skills, my leadership. I also want to learn new skills from other departments or services.”

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

### Role of entrepreneurship and innovation in education in the next 5 years?

- Better teaching
- Better opportunities to learn
- More impactful in society
- Engineers will benefit more than all
- They should be taught earlier

### Additional comments and suggestions:

“If I had been taught to start earlier, I probably would have started my business by now. Entrepreneurship should develop much earlier, like in kindergarten in some countries with role-playing. It's very cool and interesting. We need to change the taboos in France around money.”

“I think that in 5 years, students will be well trained in entrepreneurship and who knows, maybe many of them will want to create their own business no matter what their field of activity.”

“I think that this will develop in very specific fields, such as engineering. Moreover, we can see that start-ups also have the opportunity to innovate.”

### How to ensure the best entrepreneurial-oriented and innovative education

- not one solution fits all,
- new learning platforms,
- project-based learning,
- greater involvement of experienced entrepreneurs,
- better tools to better knowing the self

## Viðauki 5 – Niðurstöður frá Art Square Lab, Lúxemborg

### Outcomes from the group discussions with companies, Art Square Lab

---

#### Validity of the results

We managed to bring together new entrepreneurs as well as mature entrepreneurs from bigger companies as well as the intrapreneurs in corporations like bank. We reached out to them by personal contacts knowing that they might bring a valuable input to the conversation.

#### BUSINESS DEVELOPMENT

---

##### Skills for entrepreneurs – existing and needed

- hard skills
  - *participants shared that they are more easily learned than soft ones. Some might vary depending on the activity, as for instance communication skills might be more important in a selling activity than an IT one, which involve less contact with customers.*
  - *The skills might also vary if the entrepreneur is new to it or experienced. For some participants it is important to have basic knowledge of various fields as **accounting, finance, tax law, and marketing**, considering that numerous entrepreneurs create a one or two people company. In some participants' point of view **organizational skills** are needed, notably to acquire some self-discipline, as **methodologies and concrete tools** to reduce the risk of failure (business canvas, lean methodology...). **Negotiation skills** have also been mentioned as **communication skills**, the ability to **sell oneself**, be **one's enterprise ambassador** and to **build your ecosystem**, to **connect with peers** through social media (Instagram story for instance) etc. Having knowledge of **existing IT** as developing a **technological watch**, and being able to **combine this knowledge with creativity** is perceived as important as well.*
- soft skills
  - ***attitude and mind-set** were discussed extensively. Intrapreneurship is very important, as entrepreneurship, and entrepreneurial mind-set may express itself as an entrepreneur or as an employee, part of a company.*
  - *An **attitude toward failing** is important, to not fear it too much, rather accept it as a part of the process and that it brings meaningful information in order to move forward.*

- *need to develop entrepreneurs' ability to **deal with change on an everyday base, be flexible and adaptable**, and learn how to fail quickly at cheap cost through the **lean start up methodology**.*
- *entrepreneurs in the early developments of their projects should stay **open-minded** to the fact that their idea might need to change and evolve considering the market.*
- *entrepreneurs should explore beyond one's industry and be curious*
- ***Leadership**: being genuinely interested in people, being human-centred, interested in problems and opportunity driven, being aware of the potential of others and being able to leverage the group effect, to connect and exchange with others, to give room for reflection*
- *Entrepreneurs should **be proactive**, make things happen (**hand-on attitude**) and be **bold**.*
- ***Creativity** was also listed as a skill. Some programs in big companies aim at creativity and involve applying new pieces of knowledge to current processes*
- *Entrepreneurs should develop their **learning skills and continuously learn**. Reading books, watching movies, being mentored, listen to testimonials (and failures) of successful entrepreneurs, going to conferences and workshops*

## Innovation in the business development

- *One of the participants is a coach in an important banking group in Luxembourg and mentioned that the banking sector will be disrupted in the 5 years to come by technology, and that there is no way to know how. Hence, a positive attitude toward change and innovation play an important role in the company's culture and are enhanced through numerous initiatives (innovation/boot camps, design thinking academies, innovation labs, scouting and venturing in the fin-tech market, coaching through a method combining design thinking, lean start-up and agile philosophy...). For this participant the individual in the company should have an entrepreneurial mind-set, but the company, through its culture should support the individual, in order to allow innovation to happen.*

## UNIVERSITY-BUSINESS COLLABORATION

---

### Collaboration with education providers and students

- *a speaker in educational events in Luxembourg through the (CcLux) Luxembourgish Chambre de commerce's special initiative called "Relation-Ecole-Entreprise"(REE). As a part of this initiative the participant goes to high schools and universities in Luxembourg in order to talk about entrepreneurship, business creation, opportunities of becoming entrepreneur as well as: Why to become one, how to start "risk-free" and what exact project the students could start with. Beside the Cclux, the participant mentioned the association "Jonk Entrepreneuren Luxembourg asbl" (JEL) which organizes and offers different programs in order to introduce youngster to entrepreneurship and to open their horizons in domains of project management, innovation and entrepreneurship*

- *Finally, HoE and Cclux are partners of the Uni.lu Incubator. Two of the participants offer coaching and trainings to their start-ups.*

### Students' entrepreneurialism and innovativeness

- *reducing the fear of failure and creating some psychological safety are very important. To answer the questions of why and how becoming an entrepreneur, as "what to do", helps. Explaining what is entrepreneurship, what qualities are needed, combined with hard skills, tools and methods to be used to start. It was also pointed out that coaching and mentoring are important and should be combined with theory, and that the students might need someone able to answer their questions through their evolution as entrepreneur in the making.*

### Challenges encountered

- *openness of the company for entrepreneurial mind-set and trail/errors of the employees; the sandbox space where ideas can be tested, where prototyping can happen and where there is no punishment for mistakes. For example in one bank there is a program for young graduates/last years students who can work flexibly in various projects and are expected to bring an interesting input and more innovation. They are welcomed to make more mistakes than other employees and they are often offer the job afterwards.*

### Threats and demand for change

- *if education will not change to train more future competence of the students and let them research, ideate, prototype and test - the students will have a very little chance to develop new skillset needed for the jobs of the future. More project oriented work related to reality is needed.*
- *Luxembourg specifically would like to have the label of "start-up nation" but most of the small companies are imported to the country and the local mind-set (high risk aversion) promotes wide employment in public sector and secure work career, with very little risk.*

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

### Educational support needed for business development

- *having experienced entrepreneurs sharing their failures would be a powerful tool to create this psychological safety. Moreover entrepreneurship is not new, hence what students need to know is what it means to be an entrepreneur today.*
- *there are 2 types of potential entrepreneurs: the first one has a vision and should stick to it, believe in it. The other one is learning how becoming an entrepreneur, and to do it a good way would be by experimentation and a small steps approach: the potential entrepreneur shall start a small project (as an event for instance) with a clear output, learn by doing and go bigger. This experience being a good way of learning how one's manages, how one is acting and reacting in the context of a project*

- *Learning by doing is important when it comes to entrepreneurship. They propose the use of visual examples of the steps behind creating a business project.*

### Role of entrepreneurship and innovation in education in the next 5 years?

- it will become a “must” for the companies to employ people with entrepreneurial mind-set, also those who have already experience with running a start-up (even if they learned from own errors).
- the innovation in education is generally welcomed but must be connected to the needs of the market, flexible, promoting life-long learning. As the trends for 2020 say (Wired magazine) maybe in the future our study time will be dispatched in various moments of our professional life more naturally.

## Outcomes from the group discussions with teachers, Art Square Lab

---

### Validity of the results

The teachers were recruited by mobilisation of contacts in the educational sector in Luxembourg: at schools, university and educational initiatives. In result 7 university teachers and one secondary school (Ecole De Commerce et de Gestion) teacher were present. All of them were selected based on their interest or link to the entrepreneurial education (either as research topic or direct work with the students on this topic).

### ENTREPRENEURSHIP AND INNOVATION IN TEACHING

#### Innovation in teaching

- *One participant who teaches design do it through an industry project in which students use design tools develop an understanding of the problems, of clear barriers, and in a short time frame develop solutions. The idea is to foster students’ entrepreneurial skills by doing, supported by a theoretical background.*
- *study in detail of key examples in order to see how other entrepreneurs have done, what risk had to be taken, in order to succeed. Thus, hearing testimonials is very powerful to help students being less risk-averse. Also spending a lot of time on prototyping skills allows the students to see a way of reducing risk, managing risk*
- *help the students realize that they are more imaginative, more creative, than they give themselves credit for, and those moments of self-awareness are important in the journey to an entrepreneurial mind-set.*
- *an entrepreneur needs a range of experiences. Learning by doing is the best way to transfer a bit of an entrepreneurial mind-set. It is also transferred to students through a lot of team work.*
- *take time at the start of the course for a personality awareness process. Students need to know who and what they are. Trough personality tests they help them assess their*

*propensities (their risk propensity v. risk aversion notably) and short-comings, and give them a vision of how their brains work. Students are given a number of creativity tasks using classic design tools in order to realize that they are more creative than they think they are. Students are also given tools to be able to assess if their ideas and decisions as entrepreneurs are desirable, sustainable and doable.*

- *a cultural platform for students to experiment and fail. As they are being highly challenged in a safe space, this tool allows to unlock creativity*
- *abstraction layering.*

Additional comments and suggestions:

It was essential to start with the explanation of the definition of entrepreneurship as it turned out that there might be a difference in understanding of the term. *The participants started by defining what “entrepreneurship” means to them:*

*The ability to seek new opportunities that have not been encountered before, to challenge the status quo, do something new, to be outside of your comfort zone, to be empathetic. A participant mentioned interdisciplinary centres in which entrepreneurship means being able to make new connexions between knowledge, information and people. An entrepreneur is also seen as someone who is solution-driven, and have a long-term vision, who is a visionary as someone who has the ability to imagine something that doesn't already exist, something that might even be seen as “crazy”.*

*For another participant it is the ability to become creative in order to achieve one's goals and dreams despite resources boundaries. It is a combination of vision and conviction (usually people might have one out of two) for another one. For all it is a disposition, a mind-set, which comes from embodied characteristics in one's character as imaginativeness and lacking the common risk/loss aversion. These embodied characteristics, part of one's personality. It is explained by a participant that this mind-set comes from patterns developed in one's brain in early childhood. And if these haven't been developed, they take time to be unlocked and need to be reinforced over a long time: “it takes time to rewire the brain so that one becomes less risk-averse and more imaginative”. However, from this postulate, the participants try to transfer innovative and entrepreneurial mind-set to their students.*

## Feedback

- *Teachers are soliciting feedbacks at multiple times, through informal conversations, for instance after class. Moreover, at the end of the course cycle the teacher give a form to the students, this feedback is for the teacher only. Finally students have an opportunity to give a formal feedback which goes through the university channels. Teachers also often receive emails after the course of students about the use they made of their learned skills, for instance if they implemented it in their company.*

## ENTREPRENEURSHIP AND INNOVATION AMONG STUDENTS

---

### Students' entrepreneurialism and innovativeness

- *in a private university: the Design and entrepreneurial brand of the university attracts more entrepreneurial students than average, students who want to do a MBA and have with big dreams. But even considering this they consider that they could be a lot more entrepreneurial and innovative if they had started learning these skills at school instead of at the university level.*
- *in public university and schools in Luxembourg, all students are in some way entre/intrapreneurial when they are involved in a course where they learn by doing. The students are found very motivated and liking these programs. The participant would evaluate that 7 to 10% of students are in fact entre/intrapreneurs.*
- *initiatives in the Luxembourgish University that support entrepreneurship/innovation: they target all the students at the university, and try to give them an entrepreneurial/intrapreneurial mind-set (leadership skills, negotiation skill, pitch skills, selling skill) though for instance: hackathons, innovation camps, ideation camps, entrepreneurship course with a high practical side, a special PhD path, summer school for one week with PhD students and researchers with service de la Jeunesse, specific events as workshops with special speakers from the MIT entrepreneurship centre*
- *tight relationships between the University and the Cclux and the HoE in educational programs and events with exchange of human support for instance.*
- *challenges proposed by external partners to their 16-17 years-old students. They then have to analyse the problems, find solutions and present them. Small enterprise program has also been mentioned. There is also another program offered to BTS students which is a competition in which they have to develop a business idea and create a business plan. Some young students also do a week internship which give them a first contact with the business field. A 4 months internship is also included in the curriculum of university students*

### Challenges encountered

- *in private universities: they receive a lot of support from their workplace. Hence, the teachers are invited to use their own connexions, however in case of lack thereof, the university will mobilizes its scholarship and provide partners. The university supports also the overall course development. The university puts a lot of value in its students' outstanding experience, and is prepared to invest in it. An example was provided with a course in collaboration with a hospital, in which students were invited to redesign a process. They led interviews with patients, analysed patients' journey and redesign it, and fully developed solutions. Wishing to implement those solutions the hospital asked if the university would collaborate with them one more semester on the implementation of the solutions. Even in this unprecedented*



*situation, the university supported the project and created the law structure to make it happen*

- *the students are stuck in the past, have issues around their ego and defence mechanism. They find that a key barrier difficult to break is around failure and what it means for their identity, they have difficulties seeing failure as a step toward success. The risk-aversion barrier has been mentioned several times by the participants.*
- *the majority of students doesn't have an accurate vision of the job market today and what awaits ahead of them, most of them think that they will find a job at the end of their studies and will stay at the same company for the next 40 years, and that vision of a linear career-path is not accurate anymore.*

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

### Role of entrepreneurship and innovation in education in the next 5 years?

- *witnessing big steps in every direction, particularly in computer technologies; but also around power, political affairs, and we will witness an economical shift as a social shift. An important question will be how much we can take in from various information sources, retain it and make novel connections between things, unconnected and disparate information. Hence a critical way of thinking, an innovative mind-set will be important skills in order to be well-equipped no matter what direction the future goes.*
- *the students will need to have more awareness, to be psychological more advanced, to know who they are and be advanced human being with high moral standards in order to change the world. For this participant future entrepreneurs will have an impact, on other people, on their environment, and their education should help them be aware of that fact, to have consideration on their behaviours and decisions. Education should help bring more entrepreneurs that think more holistically, systemically and sustainably, than selfishly*
- *students could be made aware of the fact that being an entre/intrapreneur is a way to have an impact, to act on things that matter.*
- *students should be made aware of the down side of being an entrepreneur: might be difficult to maintain a balanced way of life, many entrepreneurs are obsess with their entrepreneurial activities and have trouble making time for other things (friends, family, an healthy life style...).*

## How to ensure the best entrepreneurial-oriented and innovative education

- *The right attitude from teachers has been cited as a way to make the students experienced notions like co-creation, collaboration and the right attitude toward failure. Hence instead of being in a very top-down pedagogy, in which the teacher is supposed to know everything, and the students have to navigate by themselves, the teacher can demonstrate co-creation and the right attitude toward failure. Therefore a puzzling question from a student can become the perfect opportunity to embark the class-room on a journey to find the answer together, the teacher being comfortable with not knowing.*

## Outcomes from the group discussions with students, Art Square Lab

---

### Validity of the results

The students were invited by the partner school of business and management who is interested to become associated partners of the project. One of the subjects taught is Entrepreneurship and therefore the school management decided to collaborate with us on this focus group.

## ENTREPRENEURSHIP AND INNOVATION IN STUDIES

---

### Skills for entrepreneurs

Mainly students connect entrepreneurship with responsibility and innovation. They consider that part of entrepreneurship is to take decisions and be responsible for them. Creativity is also an important part of entrepreneurship, how to come up with new ideas, respond to the needs of users, create new solutions that already don't exist.

- *I like to take responsibilities, to make decisions for one group of people. It means a lot for an entrepreneurial mind-set, it is really important to make decisions and take responsibility for it.*
- *I like working for myself, to do it alone, not putting work to someone else, even if it fails, I like to take responsibility.*
- *Need to be independent, taking decisions.*
- *I am the kind of person who likes to make decisions. For example, when we have group work I feel comfortable to make decisions, if they are not too sure, I am making decisions.*
- *I think that many young people have a problem to step out, to make decisions, to develop their own ideas. Better stay behind them.*
- *For me to be innovative it is probably the most important,*
- *I would like to set up my own company also, but first need to finish school and get some capital.*

- *I think that I am also a very creative person, I like to create new things. I would also like to have my new shop. I have an idea, but not concrete. I come here to learn more, to listen to other people, and get inspired.*
- *I also would like to have my own shop, but already people are using this idea. I need to find some more innovative ideas, because it wouldn't work. It is a little bit risky at the moment.*

Additional comments and suggestions:

The students would like to learn negotiation and modern approach in business like agile, design thinking, students mentioned also creativity. They are afraid that knowledge they get in school is not updated. They would like to learn also in a different way, also the way they learn, they mentioned that through collaboration and peer learning they could learn more. They would like to avoid silos, which already exist in school (specialisations) and mixed students to share different skills and competences and collaborate on some

projects. Another important skill is how to build a network, where to find potential partners, develop ideas, build companies.

*I found school is pretty good, about sales is good.*

*I would like more recent approaches, about products, like this mooc in school. Updated knowledge.*

*Maybe ... There are 3 different sections. But we should cooperate, do projects together. I have more skills in marketing, but I need people from another section. Would be great to learn from each other. You have other competences and skills.*

*Breaking the silos!*

*It would be interesting to mix sections, to do some projects together. Not only my class, I was pretty stacked with my team...*

*It will help you for the future, create synergies.*

*It is also about networking too. It is also to learn. To build a team.*

## ENTREPRENEURSHIP AS A CAREER OPTION

---

### A career option

Some of the students were already entrepreneurs, having their first business, others were involved in the business of their parents. Almost all of them see the possibility of opening the business in the future (as they study in Business and Management School)

### Needed skills to be an entrepreneur

For most of the interviewed students managing problems, problem solving is a key competence. Also how to respond towards changing markets and being adaptive. They mentioned two types of competences: soft skills like leadership, negotiation, self-confident, risk management, but also hard competences like numbers, managing budget, production of specific things you are dealing with, etc. One of the important competences/skills was curiosity, and being able to put yourself in the shoes of customers.

- *You have to be self-sure, self-confident, deal with problems. When you run company you have a lot of problems,*
- *You need to be an adaptive, good sales person.*

- *Leadership, charisma, the numbers, you need to know the numbers, marketing*
- *Don't be afraid to take risks. You can learn from mistakes from others,*
- *To create a company you need a lot of money. At the beginning it is quite complicated to get this money when you are a young person.*
- *You need to be curious, be open, search, have orientation what is existing,*
- *Be able to put yourself in the head of customer to see if your product is good, or if the app will be used,*

## Skills through work practice

Main points mentioned by students about getting entrepreneurial competencies was practical approach. Generally speaking, they like to learn by doing. It could be their own project, school project or internship, but they found out that for them the best way of learning is by doing, to have experience.

- *During stage in company. It is the best way to learn.*
- *You should do your own project, even if it is on Instagram. Try to build a website, sell one item. I think that you can learn more by failing than in school. You need to try, you will learn. Learn from the mistakes*

The most important thing for students is the possibility to learn, to be involved in concrete projects, get tasks and learn by doing things. Few of them mentioned that unfortunately stages (internship) are not so efficient, because usually you are not involved in any concrete project and don't get tasks which are connected to your education (mostly it is administration job, or support). But one of the students mentioned that at this stage it is a great opportunity to observe, to learn how the boss is managing the team, how people solve problems.

*"I have a student job. I work every week for them. I learn a lot. It is just a clothes shop. I don't like simple students, I need to do a job like others. I learn a lot, how to make a stock, how to talk with people, check out, operate with cash, open and close. And also the bigger thing I learned is to think like a customer. I need to go to customers, ask if they need help, guide them. If someone says no, you feel rejected, but you continue. This helps me a lot! Stage is important, the student job is really constructive!"*

*Stage is important to observe, how people behave, what boss is doing, how he/she is managing.*

*I would observe people how they are happy. How the boss treats people. I will learn from this. It is interesting to observe.*

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

### How to ensure the best entrepreneurial-oriented and innovative education

All of the students interviewed were happy with the school program and tools. They mentioned a few programs which are good examples of a learning approach (Jonk entrepreneur program with NGO, where they could work on their own project). They really appreciate working on concrete projects, to have a challenge which they can solve. Few of the students mentioned competition as one of the motivators. Also cooperation with external partners was mentioned as an important part of learning (programs from NGOs, presentation in the front of people from outside of school, collaboration with external players).

### IO1. Skýrsla um gagnasöfnun

*I think schools are doing it. Commerce and gestion, you have to be open to people, you have to talk, do presentations, work with a lot of people, and change groups. It is like a work life. It is a lot of teamwork*

*I think Jonk Entrepreneur project was great, more concrete, practical*

*The competition was nice too, team work. To work on something concrete, not only theoretical.*

*You need help from others, to reach out, to call people. You see more of the business world. In school you follow mostly students.*

*I had to create a 50 anniversary project, I was calling people etc. It was not for real, but was a lot of stress and fun.*

*It will be in the entrance of ecg, there will be open concerts, events for children.*

*I had a lot of contacts out of schools*

*Presentation for people from out of the school. We are making a presentation about how you calculate revenue, and you have to present for people from out of the school. It can help you to get confidence also.*

### Additional comments and suggestions:

As a main resource of knowledge they mentioned the internet. Specifically a lot of them search for knowledge, information on social media, and YouTube. They see movies, clips, videos as more interactive. Important for them is also a community, where they can exchange and share knowledge (few people mentioned Facebook group). Some of them mentioned also parents as a role play from whom they learned a lot, they are observing, sometimes also they are encouraged by parents to set up own business.

## Viðauki 6 – Niðurstöður frá MSS, Íslandi

### Outcomes from the group discussions with companies, MSS

---

#### Validity of the results

Vísir: One of the biggest fish companies in Iceland who are leaders in entrepreneurship in technic in the production and product development. Their goal is to use 100% of the fish they are catching and finding new products from the waste.

Yarm: Entrepreneur who was interested to make and create handcraft form Icelandic wool from scratch. Now she is selling her products worldwide.

Hjá Höllu: The company was made from an idea of a woman who was taking care of her young children at home. She was very interested in healthy food and started in her own kitchen to cook and sell to companies. Today she has two restaurants and is selling thousands of meals per day to companies.

Blue Lagoon: One of 25 wonders of the world. About 400.000 tourists (80) % to Iceland visit the Blue Lagoon.

Hreyfisport: Gym and rehabilitation with focus on personal treatment and support. Also the companies are selling some equipment and products to support good health.

RATA: Supporting Start-up companies - entrepreneurs as a mentor to take steps forward and build successful companies.

These companies were chosen because they are good examples of good practice and show how one idea can become a big and successful business. Also because they are very different and give insight to the working environment in Sudurnes in Iceland.

The companies were visited one by one from the two Icelandic members of the project.

#### BUSINESS DEVELOPMENT

---

##### Skills for entrepreneurs – existing and needed

- open minded
- the ability to work in a team
- be able to listen to others
- being able to set some goals and follow them
- time
- patient and power to research
- flexibility
- to be able to follow time schedule
- organized
- resilience
- passion
- hungry for new knowledge
- critical and creative thinking

Additional comments and suggestions:

Passion for the project is everything if you are expecting good results.  
Listen and learn from people who have experience and knowledge you don't have.  
To build a strong network is very important for success.

## Innovation in the business development

- Give people time and space
- New product
- Support and motivations
- New technology
- Education

Additional comments and suggestions:

Companies can be supportive and help to build a strong network.  
Be open for new ideas, listen to the staff, build trust and motivate creative thinking.  
Follow the innovation in your business sector - see what others are doing.

## UNIVERSITY-BUSINESS COLLABORATION

---

### Collaboration with education providers and students

- Culture of education in the companies
- University in marketing, human resource, biotechnology etc. internship

Additional comments and suggestions:

- important to have cooperation and collaborations with schools/Universities to empower our grate staff and it can even create new ideas and products.

### Students' entrepreneurialism and innovativeness

- New product from fish (fish oil)
- utilization - product from fish waste.

Additional comments and suggestions:

“Not everyone needs to be the innovator. There's a threat that the innovator doesn't work for you for a long time, when he discovers something new.”

### Challenges encountered

- Resilience
- Funding
- Time management
- Stress management
- Realism

Additional comments and suggestions:

“The money is not coming the first day. Please teach students resilience and realism in education for entrepreneurs”.

“It is not fair to tell students just stories about projects of very good success. They have to know also about the challenges and difficulties of being an entrepreneur. It's one of the most difficult jobs you choose”.

## Threats and demand for change

- Fourth industrial revolution
- Market
- Green energy
- Informed consumers
- Digital skills
- Language skills

Additional comments and suggestions:

In the time of Fourth industrial revolutions there were a lot of changings both in work life and personal life. It gives entrepreneurs more opportunities and even challenges to come up with an idea and work it to a business opportunities.

Students must have good digital and language skills.

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

---

### Educational support needed for business development

- Creative thinking
- How to work in a team
- Make a business plan
- Language skills
- How to build a network
- Project management
- Funding
- Understanding the marked
- Good digital skills

Additional comments and suggestions:

To be able to work in a team is very important and gives the entrepreneur more possibility and the idea is more likely to succeed.

Without passion the entrepreneur is not likely to succeed. It is important in education to help people to keep the passion.

Introduction from companies and entrepreneurs in the study to tell students how it is in the “real world”.



## Role of entrepreneurship and innovation in education in the next 5 years?

- Understanding
- Business development
- Product development

Additional comments and suggestions:

It is very important that students, companies and schools understands how important innovation and entrepreneurship is.

Important for companies to be able to hire staff with creative thinking and gives companies more possibility to be successful.

---

## Outcomes from the group discussions with teachers, MSS

---

### Validity of the results

The teachers were from 3 schools and are teaching and motivating young people as a part of the curriculum, people buy their course because they have some idea to follow or people from Directorate of labour.

Rata is a private school mainly teaching and supporting “start-up” projects

MSS Lifelong learning centre

FS College of Sudurnes

We had some meetings with each of the teachers and discussed the project and introduced them to CDTMOOC. In all the discussions the teachers mentioned how important it is to find and support students that have interest and passion for entrepreneurship and innovation. It is important to start early in elementary schools to stimulate creative thinking.

## ENTREPRENEURSHIP AND INNOVATION IN TEACHING

### Innovation in teaching

- show the students many good ideas.
- Create a good atmosphere
- Workshops
- Brainstorming
- Teamwork
- Use the internet (Google, YouTube) to find
- Enjoy the program
- Building network
- Help them to open the mind and look inside.

Additional comments and suggestions:

“Inform students about the power of patience”.

“Important to have conversations with others about innovation and entrepreneurship”.

## Feedback

- From the students
- No discipline problems
- Students survey
- Students achievements

Additional comments and suggestions:

All of the teachers said a positive atmosphere and support is necessary for creative thinking.

## ENTREPRENEURSHIP AND INNOVATION AMONG STUDENTS

### Students' entrepreneurialism and innovativeness

- very creative students
- interest
- Teachers' interest and passion are important.

Additional comments and suggestions:

"In the beginning I gave students grades between five and seven. Now they have eight to ten. It's the beginning of the course and in the end. We have won competitions three years in a row".

- Marel Masterpiece solutions
- University of Reykjavík
- BOXID: competition

### Challenges encountered

- to have an idea
- put an idea into practice - start the project
- Tax regulations
- Their current financial status

Additional comments and suggestions:

"A teacher needs to be motivated and creative to infect students".

"Cooperation between schools and companies are important".

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

### Role of entrepreneurship and innovation in education in the next 5 years?

- Teachers have to learn and follow new technique and ideas in teaching
- More time for teaching Innovation and entrepreneurship in schools.
- Should be part of all the education levels

Additional comments and suggestions:

"Teachers and school administrators must understand the importance of innovation and entrepreneurship for the community".

"Crucial element in all education".

## How to ensure the best entrepreneurial-oriented and innovative education

- More art education
- Enhancing digital skills
- Collaboration with companies
- Flexibility
- Increased teacher retraining

Additional comments and suggestions:

“Everyone agreed that too many people were teaching in these studies without having good experience and education to do so”.

“The teacher must have a passion also about innovation and entrepreneurship”.

## Outcomes from the group discussions with students, MSS

### Validity of the results

Two focus groups: 1 with five people from MSS and 5 from College of Sudurnes (FS).

The students from MSS were finishing an Entrepreneurs course for three weeks and the students from FS were in course learning Innovation and entrepreneurship.

We had an interview frame in English and in Icelandic and the interview was based on the frame.

## ENTREPRENEURSHIP AND INNOVATION IN STUDIES

### Skills for entrepreneurs

- Curiosity
- Design thinking
- Creative
- Initiative
- Education in the field the students are interested
- Interest
- Communications skills
- Solution oriented

Additional comments and suggestions:

Support from family and friends are important.

To be able to ask questions to people that have knowledge and experience is important.

Important to be patient and have skills to learn from mistakes.

### Entrepreneurial institution

- Miðstöð símenntunar á Suðurensjum
- Fjölbrautaskóli Suðurnesja

Additional comments and suggestions:

“I spend many hours researching the internet using Google and YouTube”.

## ENTREPRENEURSHIP AS A CAREER OPTION

### Knowledge of the industry

- Through work
- Rehearsing myself on the internet
- Asking questions
- Through education

Additional comments and suggestions:

“I like to go to companies or meet entrepreneurs to ask questions and learn”.

### A career option

- Have own company
- Manager in good company
- Have many possibilities in life and work
- Follow my passion

Additional comments and suggestions:

“In my country (Poland) I have not had the opportunity to follow my dream to be an entrepreneur”.

### Needed skills to be an entrepreneur

- Interest
- Education
- understand my self
- Good confidence
- Marketing skill
- Positive attitude
- Passion
- Language skills

Additional comments and suggestions:

“The keynote is to have an interest, knowledge and to be good in communications”.

### Skills through work practice

- Knowledge
- opportunity to ask questions
- “learning by doing”

Additional comments and suggestions:

Important to have experience from the work life.

## ENTREPRENEURSHIP EDUCATION IN THE FUTURE

### Role of entrepreneurship and innovation in education in the next 5 years?

- Very important to grow as a country in the 21th century.
- More and more technical and digital things around us.
- More flexibility in education and work life.

Additional comments and suggestions:

It is good for everybody to learn Innovations and entrepreneurship from childhood.

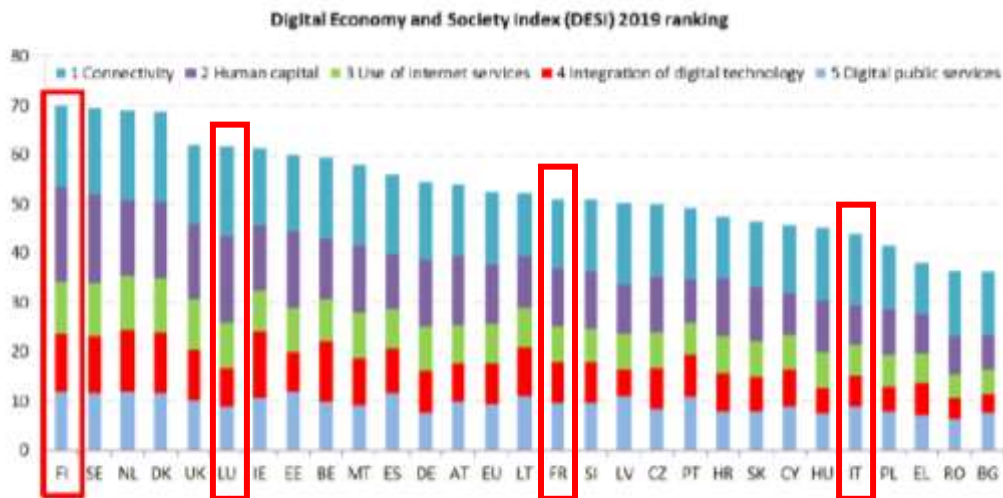
How to ensure the best entrepreneurial-oriented and innovative education

- Teach creative thinking from the beginning in schools.
- “Teach the teachers”.
- Cooperation with companies.

Additional comments and suggestions:

“Sometimes it is difficult to follow your dream and it usually takes time, but it is worth it”.

Viðauki 7 – 2019 röðun á DESI, CDTMOOC - samstarfslandanna



source: Digital Economy and Society Index (DESI), 2019 Country Report, Finland

The European Commission is monitoring Member States’ digital competitiveness through the Digital Economy and Society Index (DESI) reports. The monitoring has been proceeded since 2015. The DESI country reports combine quantitative evidence from the DESI indicators across five dimensions of the index with country-specific policy insights and best practices. The thematic chapters present a European-level analysis of broadband connectivity, digital skills, use of the internet, digitalisation of businesses, digital public services, the ICT sector and its R&D spending, and Member States’ use of Horizon 2020 funds.

**Finland** ranks first out of the 28 EU Member States with a score of 69.9 in the European Commission’s Digital Economy and Society Index (DESI) 2019. Its overall score largely surpasses the EU average of 52.5, allowing Finland, for the first time, to become the EU digital leader. Its human capital is one of its strongest competitive advantages where 76 % of the population have basic or above basic digital skills, a long way above the EU average (57 %).

**Luxembourg** ranks 6th out of the 28 EU Member States in the European Commission Digital Economy and Society Index (DESI) 2019. The country ranks third in Human capital, improving from the previous year. The percentage of individuals with at least basic digital and software skills was well above EU average in 2017 (ranked first), while the share of ICT specialist as a percentage of total employment has increased to 5 % and is well above the EU average of 3.7 %.

**France** ranks 15th out of the 28 EU Member States in the European Commission's Digital Economy and Society Index (DESI) 2019. France’s highest rankings are in the areas of Human capital (driven by relatively high shares of women ICT specialists and digital skills levels), and Integration of digital technology (as a relatively high proportion of French companies share information electronically or make use of big data analysis). Over the past year, France has adopted a number of important initiatives to support digitalization, including the country's plan to fight digital exclusion (“Plan National pour un Numérique Inclusif”), funding for digital-related training under its dedicated

investment plan ('Plan d'investissement dans les compétences'), a new national initiative for the digital transformation of SMEs and microenterprises ('France Num'), a national strategy for artificial intelligence, and several projects to modernise public services through digitalisation.

**Italy** ranks 24th out of the 28 EU Member States in the European Commission Digital Economy and Society Index (DESI) 2019. Italy performs relatively well as regards Connectivity and Digital public services. However, three out of ten people are not regular internet users yet, and more than half of the population still lacks basic digital skills. This shortfall in digital skills is also reflected in low use of online services. On the other hand, Italian enterprises score better on the use of electronic information-sharing software and social media.

**Iceland** does not appear on the chart and the latest information date back from 2015. At that time, the country was performing above the European Average in Connectivity and Use of Internet, while the Integration of Digital Technology and Human Capital were within the European average. Iceland was performing below the European average in term of Digital Public Services.

## IX. Áhugaverðir tenglar til að skoða

-  [Key findings from the 2019/2020 GEM Italy Report](#)
-  [Entrepreneurship in Luxembourg: positive perceptions and fear of failure](#)
-  [Entrepreneurship Education Podcast by USASBE](#)



## X. Tilvísanir

- Antonaci, A., Dagnino, FM., Ott, M., Belloti, F., Berta, R., De Gloria, A., Lavagnino, E., Romero, M., Usart, M., & Mayer, IS. (2015). A gamified collaborative course in entrepreneurship: Focus on objectives and tools. *Computers in Human Behavior*, 51(Part B October), 1276-1283. <https://doi.org/10.1016/j.chb.2014.11.082>
- Blenker, P. & Dreisler, P. & Kjeldsen, J. (2006). Entrepreneurship Education – the New Challenge Facing the Universities – A Framework or understanding and development of entrepreneurial university communities. Working paper 2006-02.
- Bosma, N., Hill, S., Ionescu-Somers, A., Kelley, D., Levie, J., Tarnawa, A. Global Entrepreneurship Monitor, 2019/2020 Global Report. Global Entrepreneurship Research Association, London Business School, Regents Park, London NW1 4SA, UK ISBN (print): 978-1-9160178-2-5
- Fayolle, A. (2006). Essay on the Nature of Entrepreneurship Education. Paper presented at the International Conference Entrepreneurship in United Europe – Challenges and Opportunities, Sunny Beach, Bulgaria.
- Gibb, A. (1996). Entrepreneurship and small business management – can we afford to neglect them. *British Journal of Management*, 7, 13.
- Gibb, A. (2005). The Future of Entrepreneurship Education – Determining the Basis for Coherent Policy and Practice? In: Kyrö, P. & Carrier, C. *The Dynamics of Learning Entrepreneurship in a Cross-cultural University Context*, Entrepreneurship Education Series 2/2005. Hämeenlinna, University of Tampere, Research Centre for Vocational and Professional Education, 44-67.
- Gibb, A. A., Hannon, P., Price, A., & Robertson, I. (2010). 3EP – A Compendium for Pedagogies for Teaching Entrepreneurship. Retrieved March 11, 2020.
- Hautala, Vesa & Paasio, Kaisu (2016) Developing Entrepreneurial Education Skills in HE Teachers: Lessons Learned in IDEATE project. In INTED2016 Proceedings. 10th International Technology, Education and Development Conference. Valencia, Spain. 7-9 March, 2016. IATED
- Hytti, U. (ed.) (2002). State-of-Art of Enterprise Education in Europe – Results from the Entredu project. Written jointly with Kuopusjärvi, P. & Vento-Vierikko, I. & Schneeberger, A. & Stampfl, C. & O’Gorman, C. & Hulaas, H. & Cotton, J. & Hermann, K. A publication published in the Entredu-project, Leonardo da Vinci-programme of the European Commission: Turku, Finland.
- Hytti, U. and O’Gorman, C. (2004), "What is “enterprise education”? An analysis of the objectives and methods of enterprise education programmes in four European countries", *Education + Training*, Vol. 46 No. 1, pp. 11-23. <https://doi.org/10.1108/00400910410518188>
- Hytti, U., Stenholm, P., Heinonen, J., Seikkula-Leino, J. (2010) Perceived learning outcomes in entrepreneurship education .The impact of student motivation and team behaviour. *Education + Training* Vol. 52 No. 8/9, 2010 pp. 587-606. Emerald Group Publishing Limited 0040-0912 DOI 10.1108/00400911011088935

Lackéus, Martin (2015) Entrepreneurship in Education: What, why, when, how. Entrepreneurship360 Background Paper. OECD.

Pittaway, L., & Cope, J. (2007). Simulating Entrepreneurial Learning: Integrating Experiential and Collaborative Approaches to Learning. *Management Learning*, 38(2), 211–233. <https://doi.org/10.1177/1350507607075776>

Reynolds, P. D., Hay, M., & Camp, S. M. (1999). Global Entrepreneurship Monitor: Executive Report. Kaufman Centre for Entrepreneurial Leadership, 3.

Räty, H., Komulainen, K., Hytti, U., Kasanen, K., Siivonen, P., Kozlinska, I. (2018). University students' perceptions of their abilities relate to their entrepreneurial intent. *Journal of Applied Research in Higher Education* Vol. 11 No. 4, 2019 pp. 897-909 Emerald Publishing Limited 2050-7003 DOI 10.1108/JARHE-07-2018-0119

Sarason, Y. & Dean, T. & Dillard, J.F. (2006). Entrepreneurship as Nexus of Individual and Opportunity: A Structuration View. *Journal of Business Venturing*, No. 21, 286-305.

Shane, S. (2003). *A General Theory of Entrepreneurship. The Individual-Opportunity Nexus*. Edward Elgar Publishing, Inc.UK



Shane, S. & Venkataraman, S. (2000). The Promise of Entrepreneurship as a Field of Research. *Academy of Management Review*, 26 (1), 13-17.

Tenenbaum, G., Naidu, S., Jegede, O. and Austine, J. (2001), "Constructivist pedagogy in conventional on-campus and distance learning practice: an exploratory investigation", *Learning and Instruction*, Vol. 11 No. 2, pp. 87-111.

An Entrepreneurship Education Podcast by USASBE United States Association for Small Business and Entrepreneurship <http://usasbeteachingtuesdays.libsyn.com/>

Shaping Europe's digital future, Policy, Countries' performance in digitisation <https://ec.europa.eu/digital-single-market/en/countries-performance-digitisation>

Teaching Entrepreneurship blog by teachers in entrepreneurship and co-founded by Doan Winkel, President of USASBE <https://www.teachingentrepreneurship.org/>

 <p>Co-funded by the Erasmus+ Programme of the European Union</p>	<p>CDTMOOC er verkefni sem er fjármagnað af Framkvæmdastjórn Evrópusambandsins og undir verkefninu sem kallast „Erasmus+ - KA2 - Stefnumótandi samstarf um æðri menntun“.</p> <p>Þetta ritverk endurspeglar skoðanir höfundar eingöngu, og getur Framkvæmdastjórnin ekki verið gerð ábyrg fyrir nokkurri þeirri notkun sem sem kann að verða varðandi innihald ritverksins.</p>
	<p>Skýrsla 1 um „SÖFNUN SÖNNUNARGAGNA“ hefur verið samin í samvinnu við Erasmus+ KA2 verkefnið fyrir hærri menntastig „CDTMOOC“ (Verkefni númer 2019-1-FI01-KA203-060718) og hefur verið skráð undir Creative Commons.</p> <p><a href="https://creativecommons.org/licenses/by-nc-sa/4.0/">Attribution-NonCommercial-ShareAlike 4.0 International License.</a></p>