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Managing Expertise in a Social E-Learning Environment

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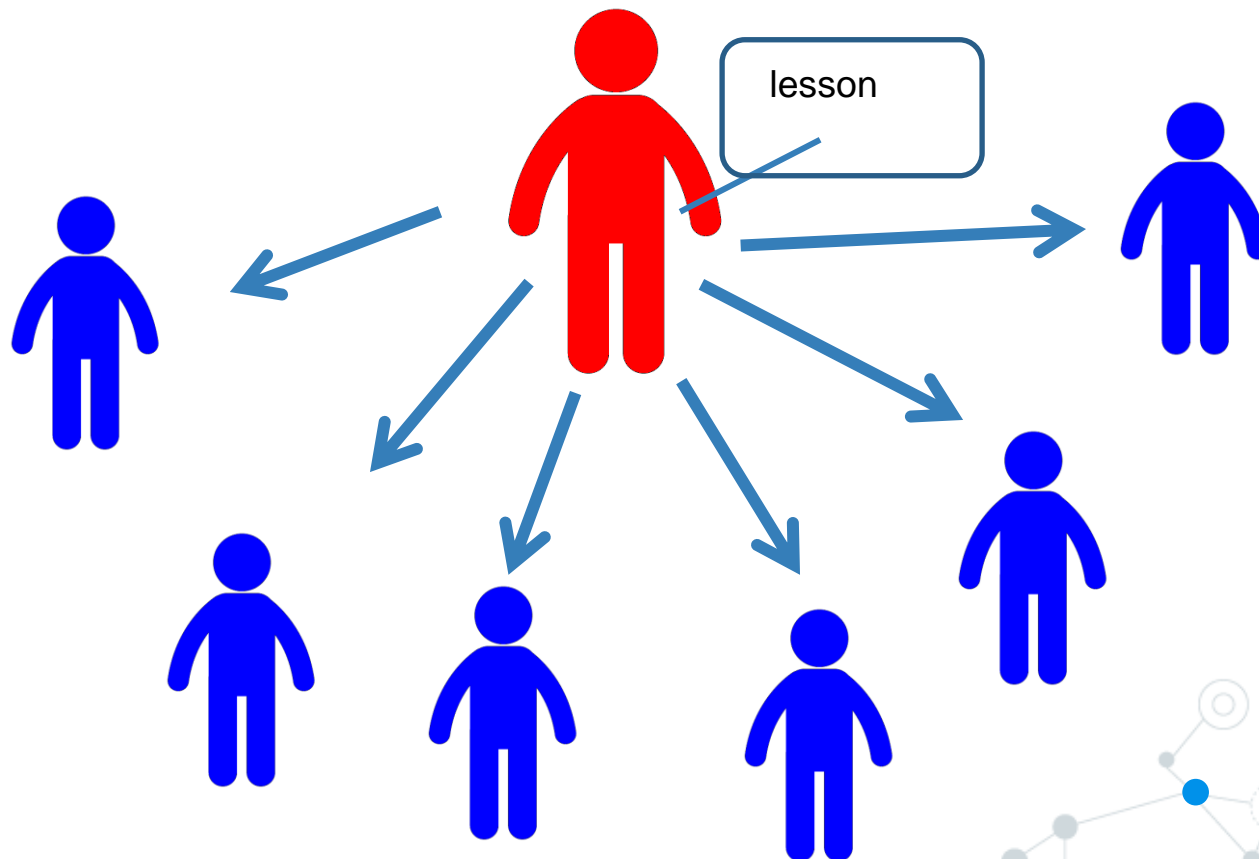
paolo.avogadro@unimib.it

It's me!



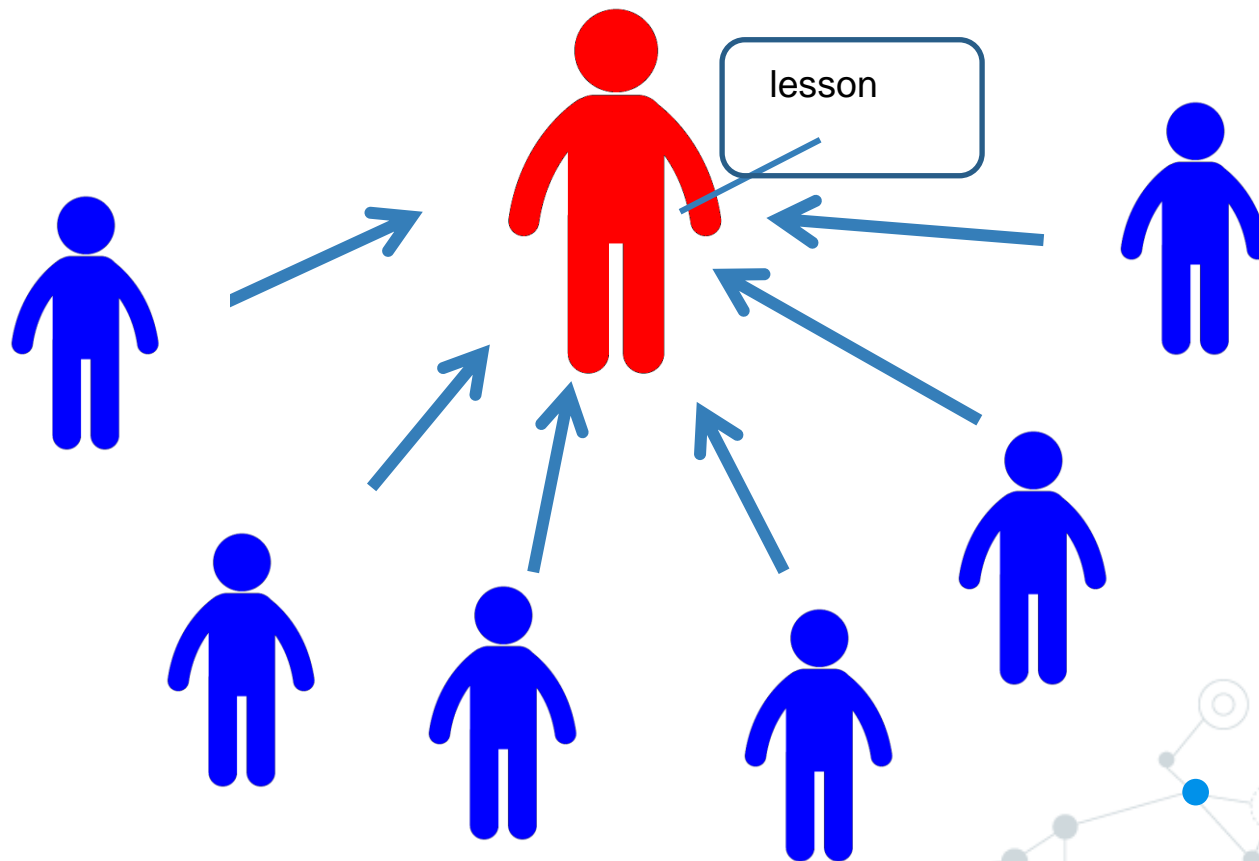
Traditional learning

Knowledge flow: 1



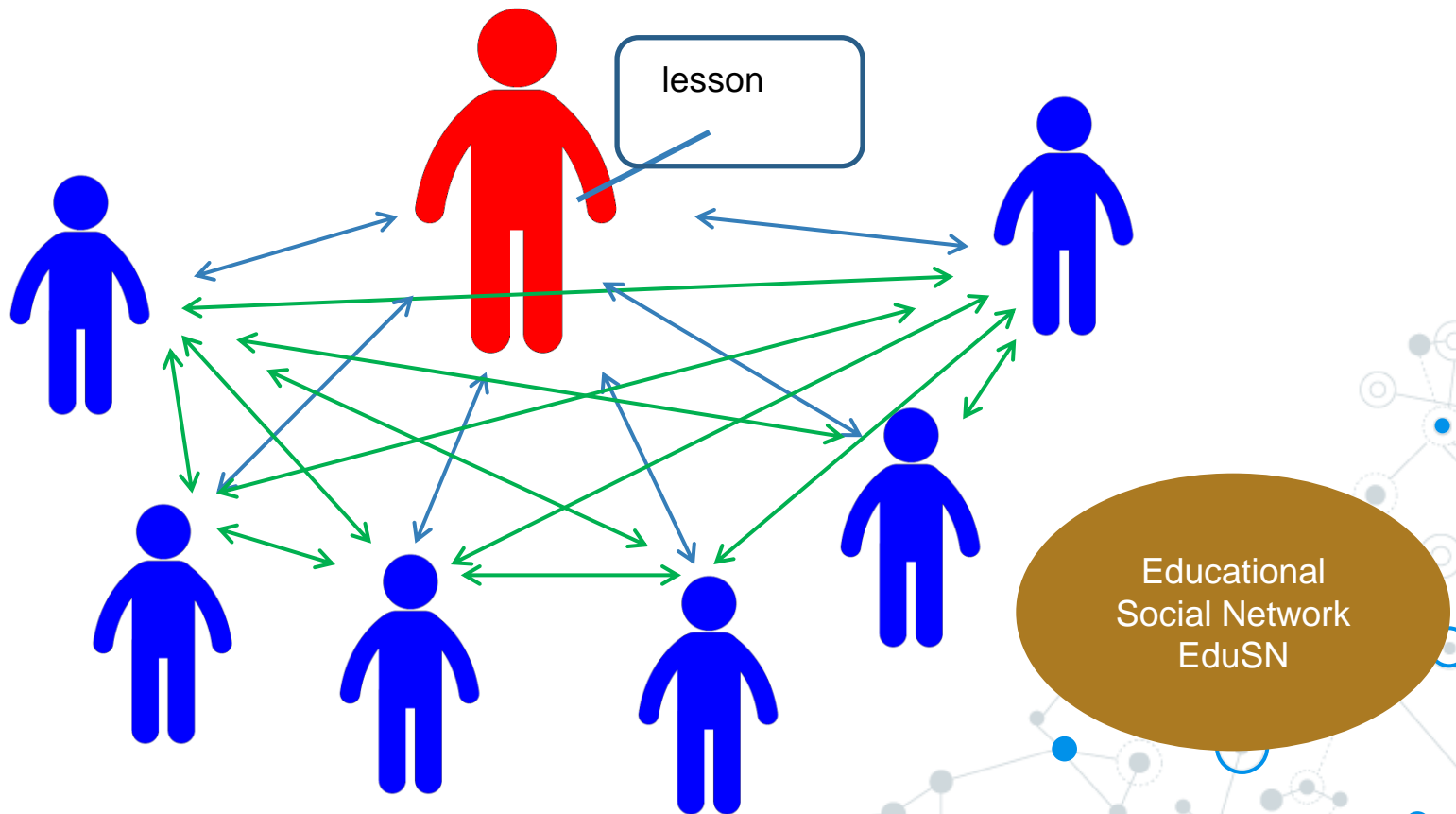
Flipped Classroom:

Knowledge flow: n



Flipped learning: Social

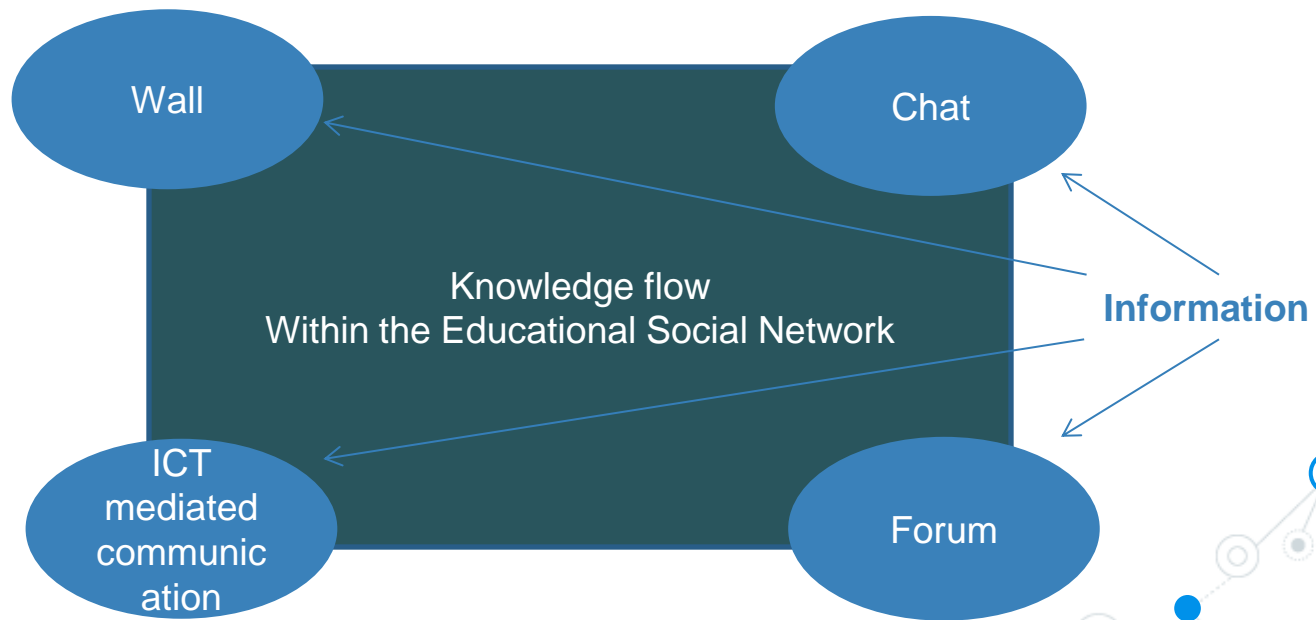
Knowledge flow: $n \times n$



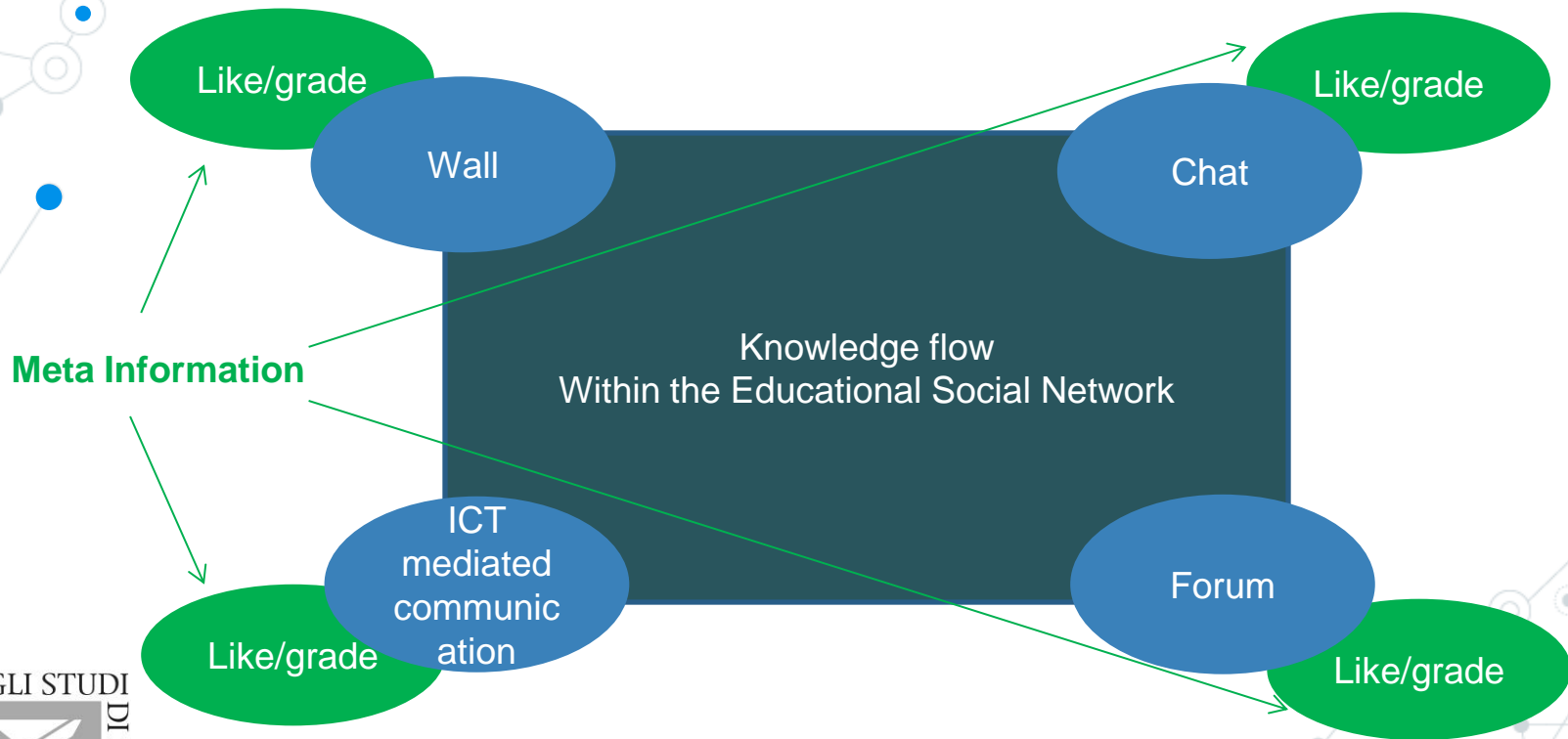
Social Learning Management System

Knowledge flow
Within the Educational Social Network

Social Learning Management System



Social Learning Management System



Idea of this work:

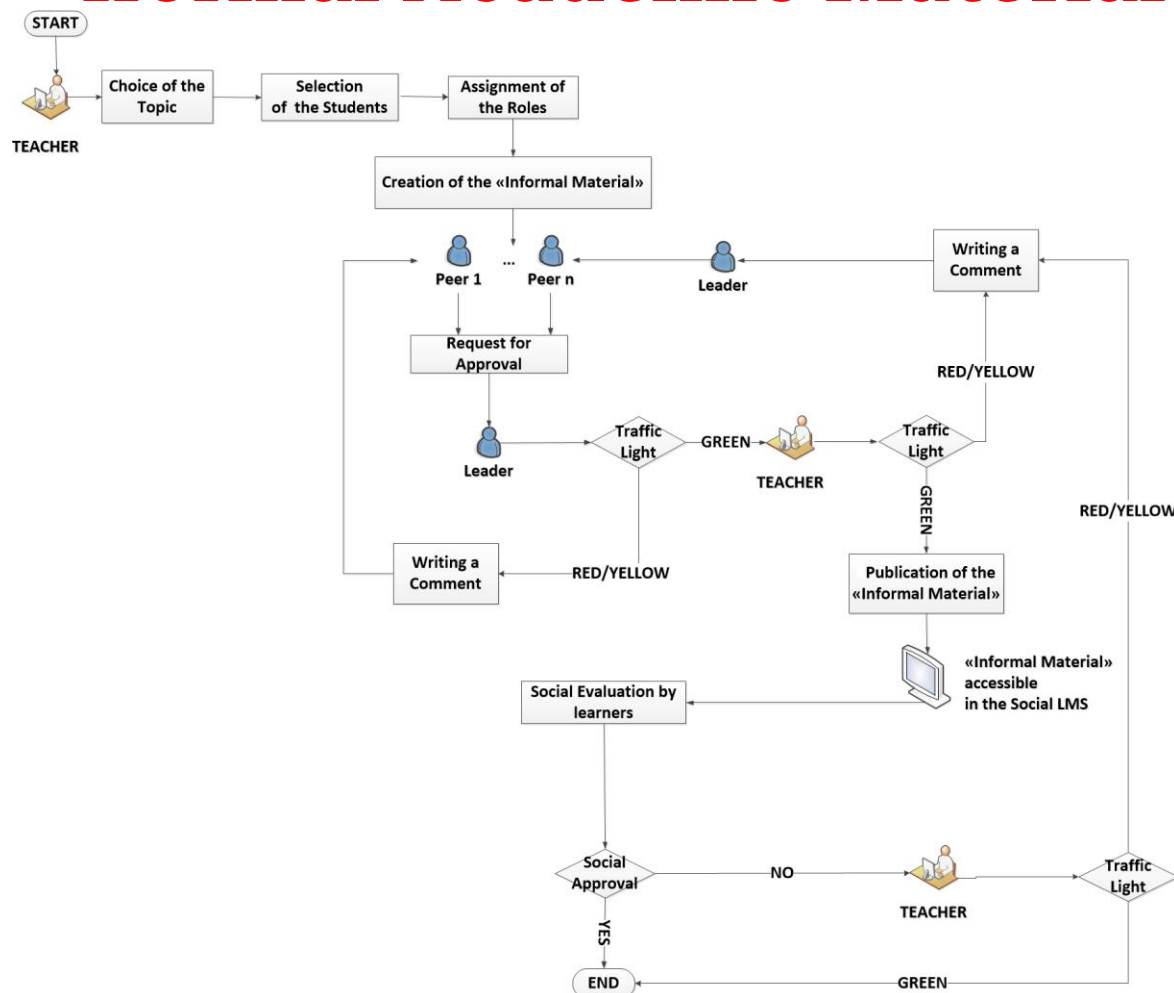
The amount of information within a Social Learning Management System becomes huge

Need to have a structured process to create high quality knowledge

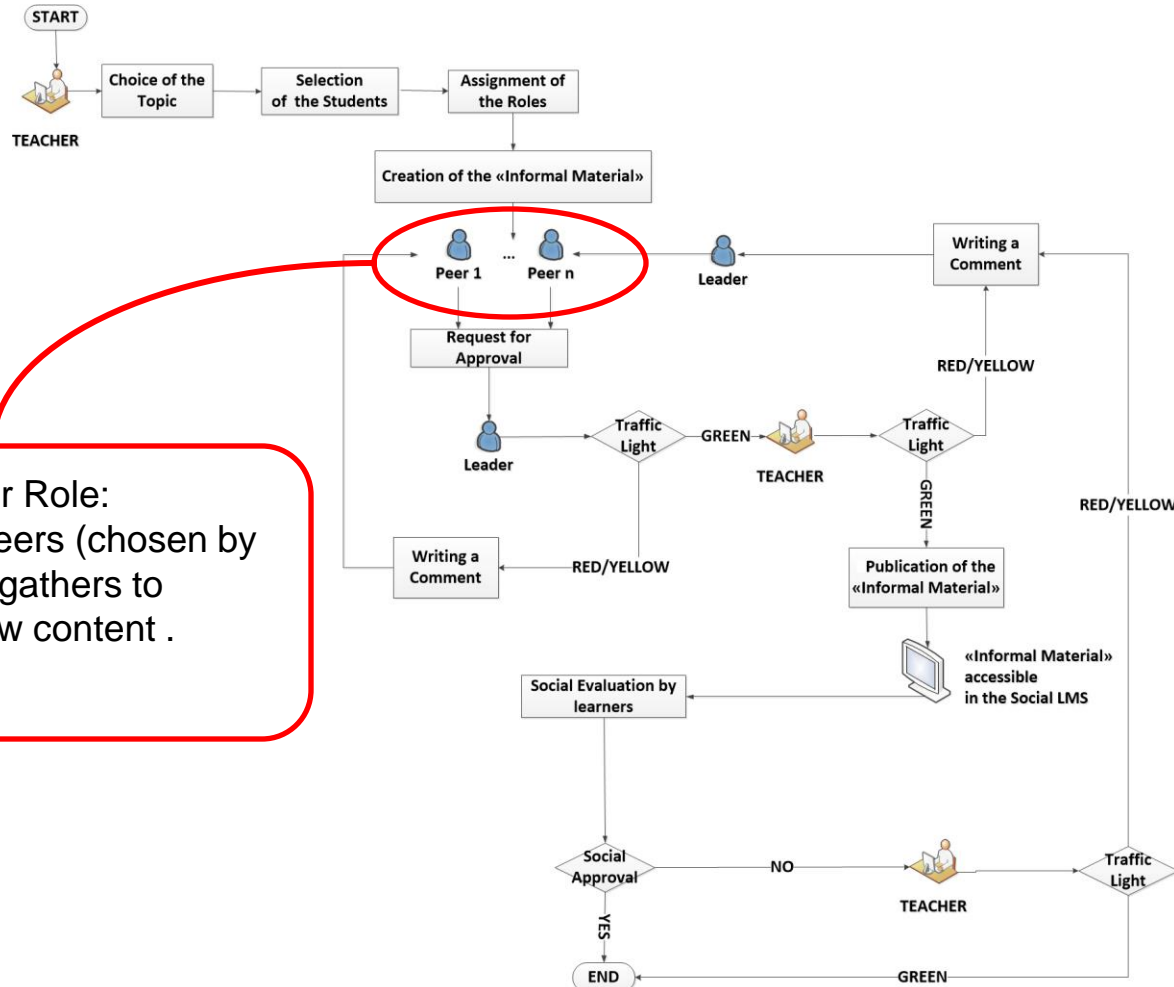
Need to assess the quality of the people who create knowledge (experts)

Guidelines for managing expertise

Publication workflow: Informal Academic Material

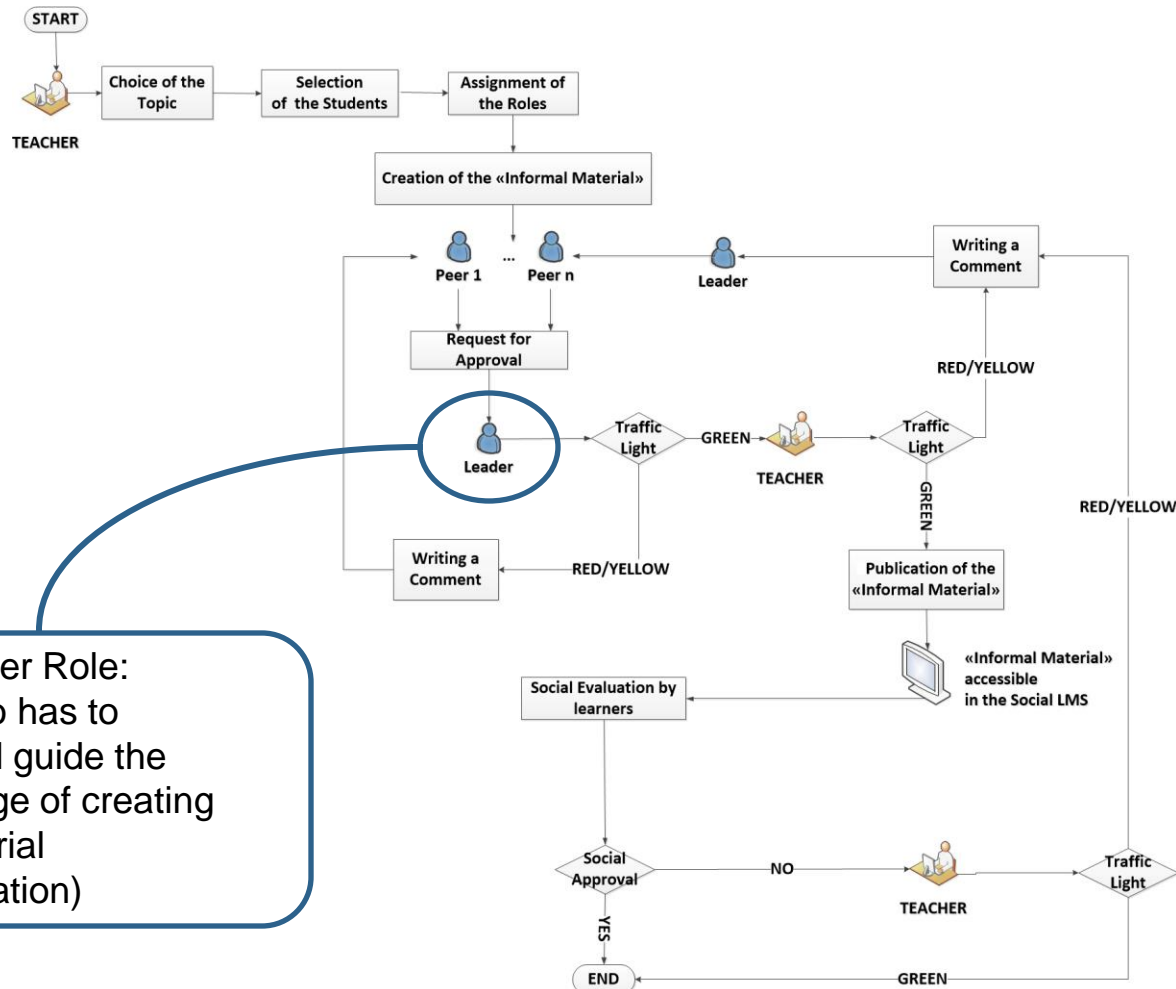


Publication workflow: Informal Academic Material



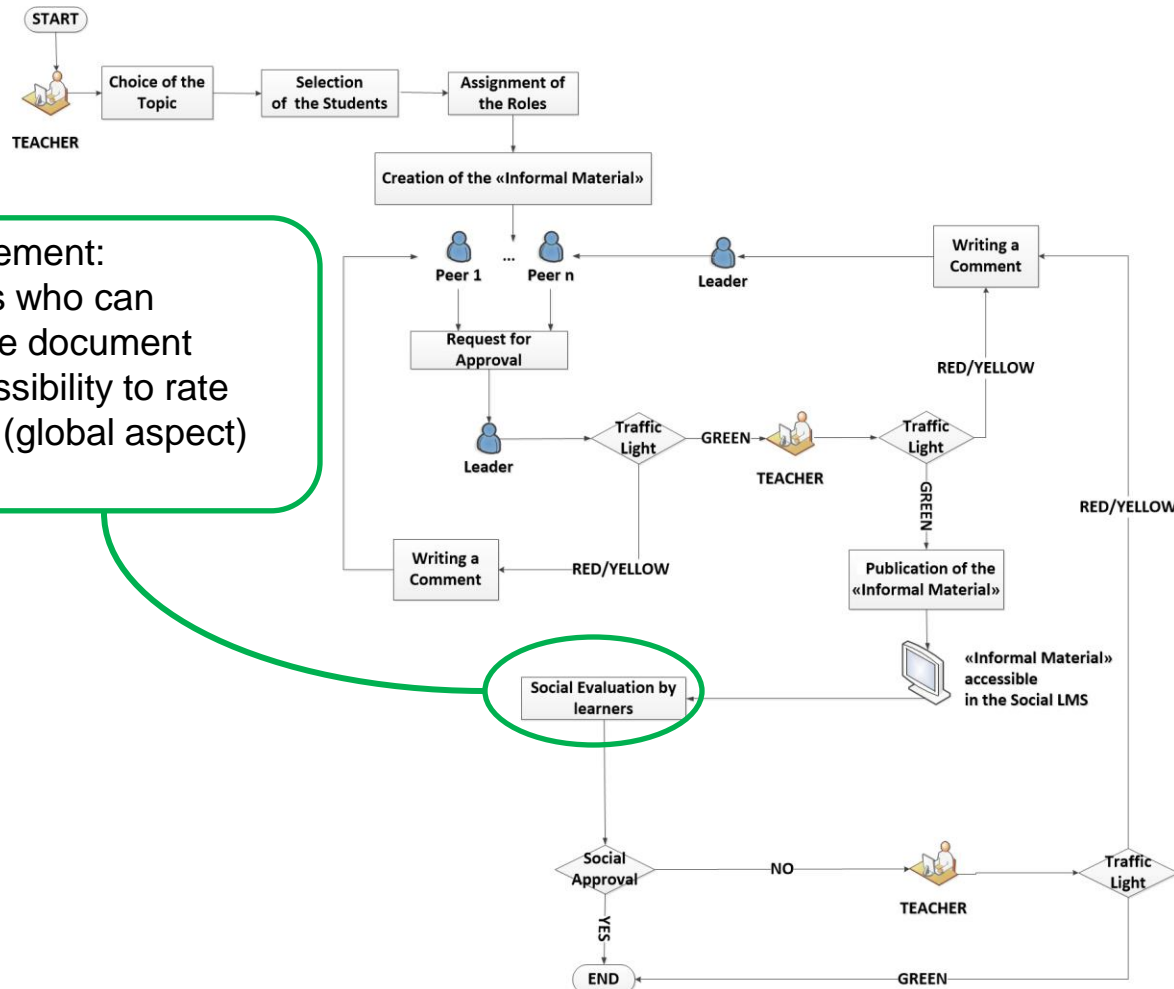
Editorial Peer Role:
A group of peers (chosen by the teacher) gathers to create of new content . (inclusion)

Publication workflow: Informal Academic Material



Editorial Leader Role:
A student who has to supervise and guide the group in charge of creating the new material (responsibilization)

Publication workflow: Informal Academic Material



Social Judgement:
All the peers who can access to the document have the possibility to rate the material (global aspect)

Publication workflow: informal academic material

• **validation:**

teacher

leader

social

• **ease:**

teacher

responsibility:

leader

inclusion:

peer

global:

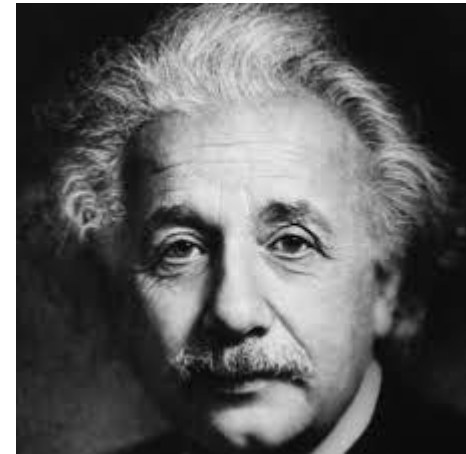
social

An Expert

(in one area)



According to the
thesaurus one
antonym of expert
is beginner



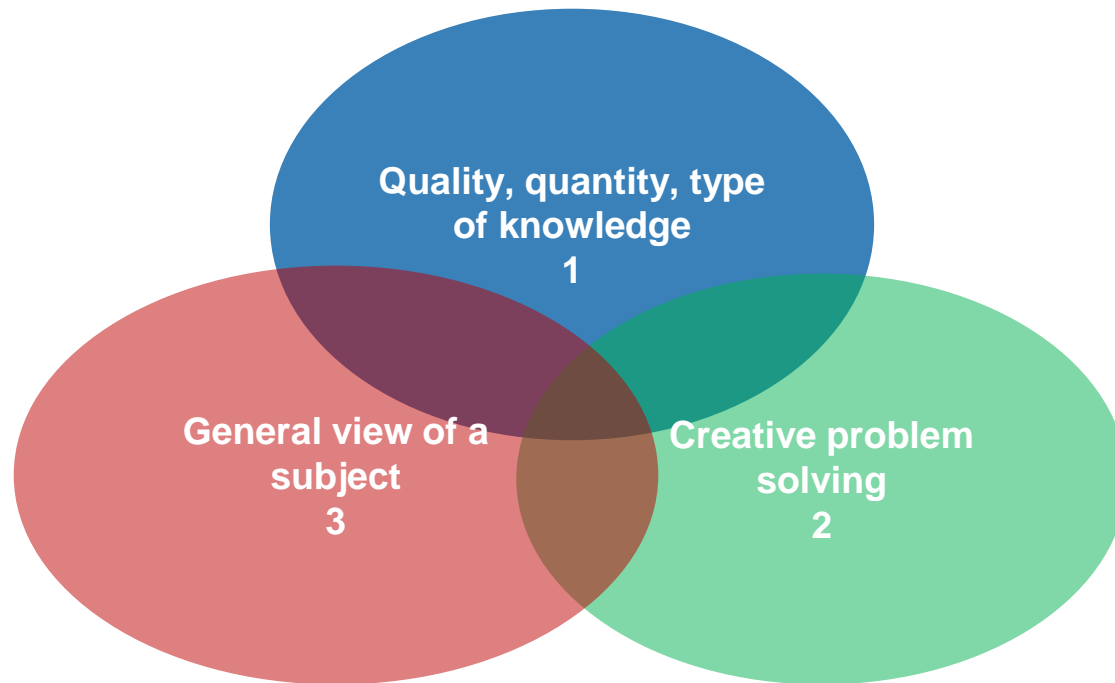
beginner

expert



Being an expert is usually
considered as a property
related to the skills of a person
and independent of the **how**
the expert interacts with the
others

There are many definitions of expertise, we single out a common core of concepts among them:



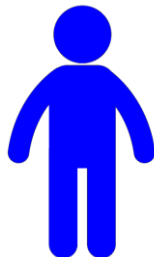
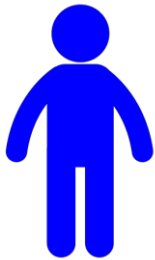
Expertise: «Ability to possess superior skills and knowledge in a particular area of study»

R.A. Swanson 1994

All the peers collaborate to enrich the knowledge flow: need to understand the **value** of the information:

Expertise:

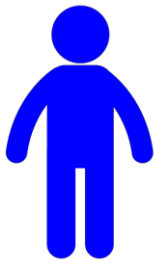
Math



All the peers collaborate to enrich the knowledge flow : need to understand the **value** of the information:

Expertise:

Math

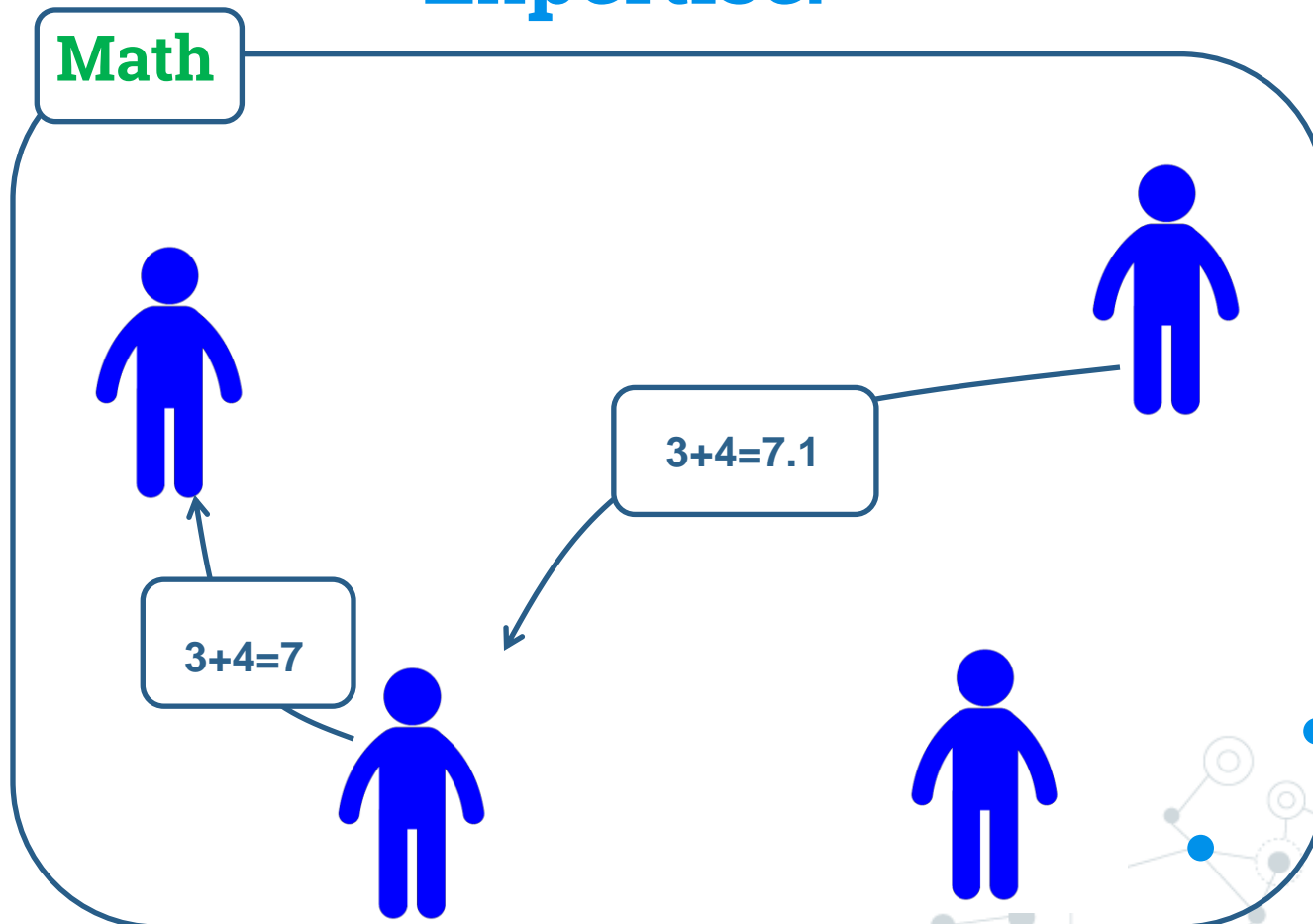


$$3+4=7.1$$



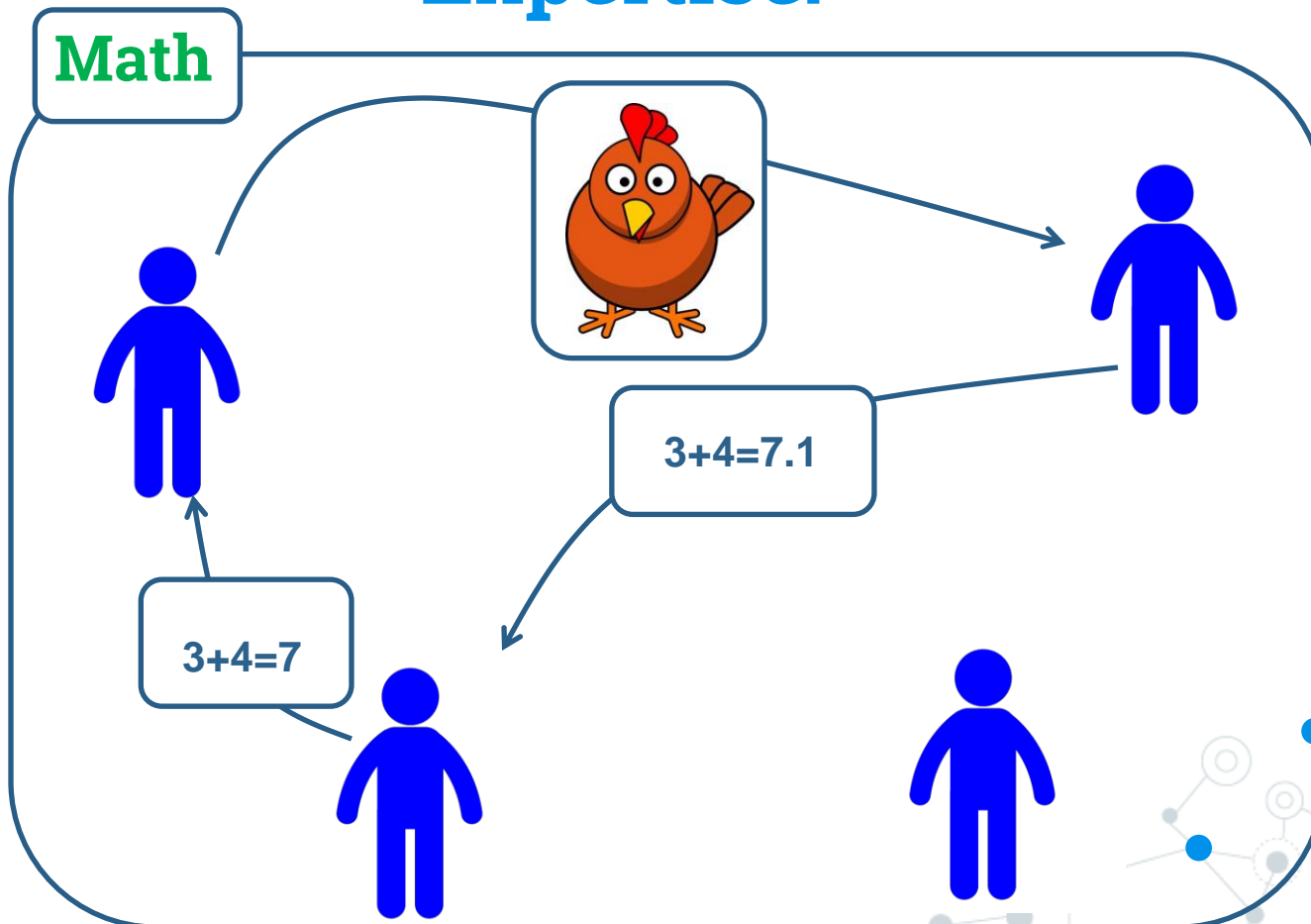
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Expertise:



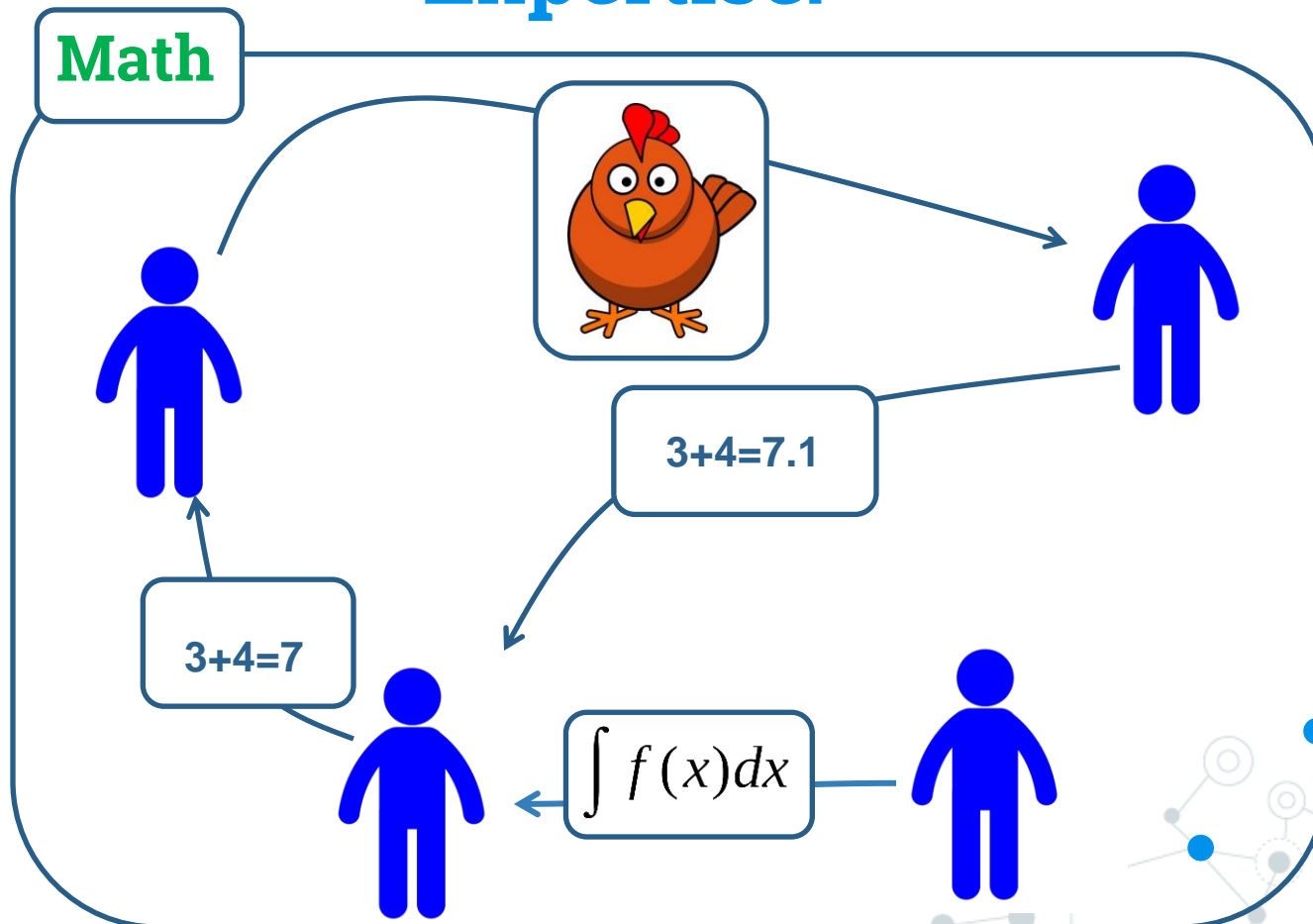
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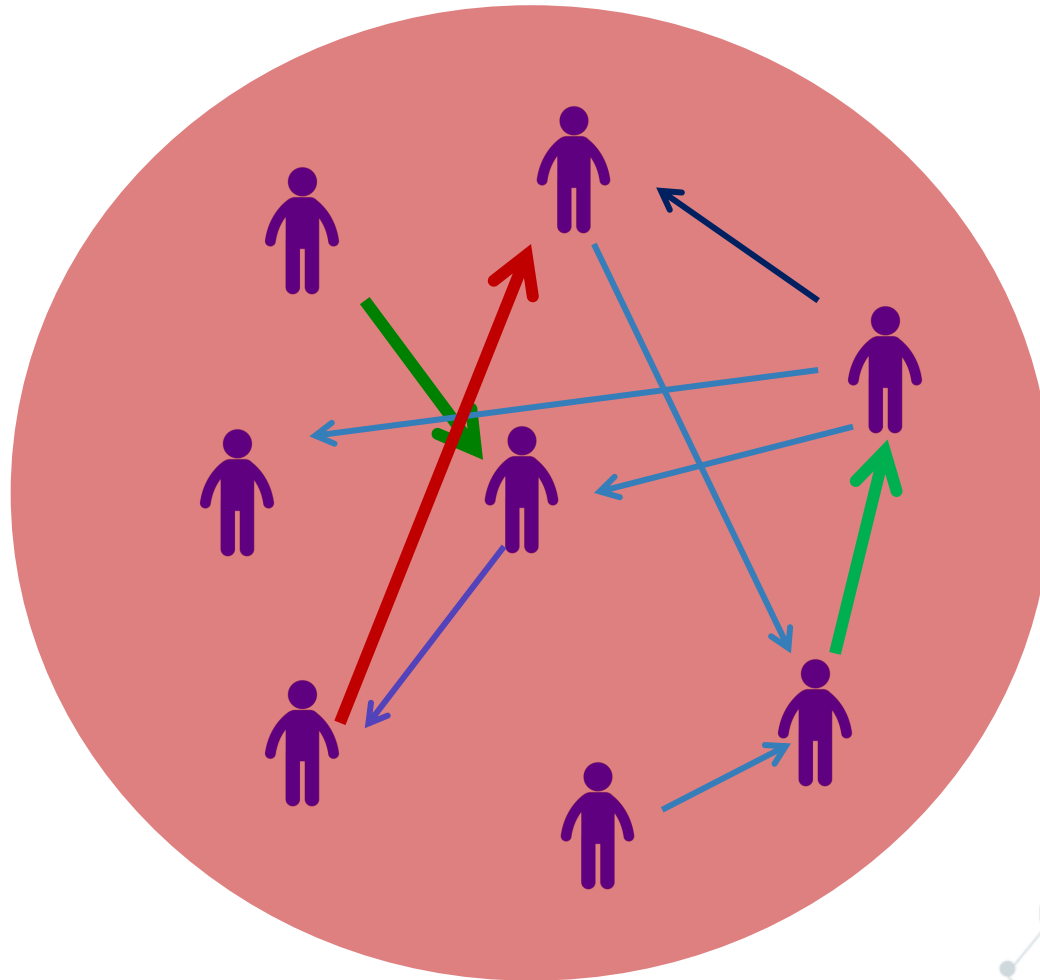


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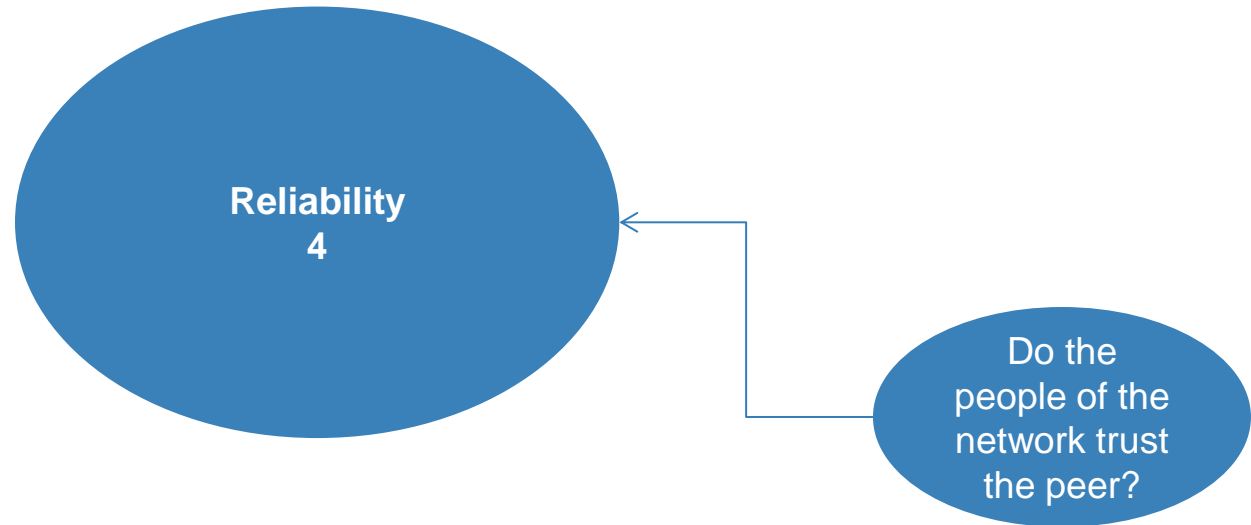


Social expert:



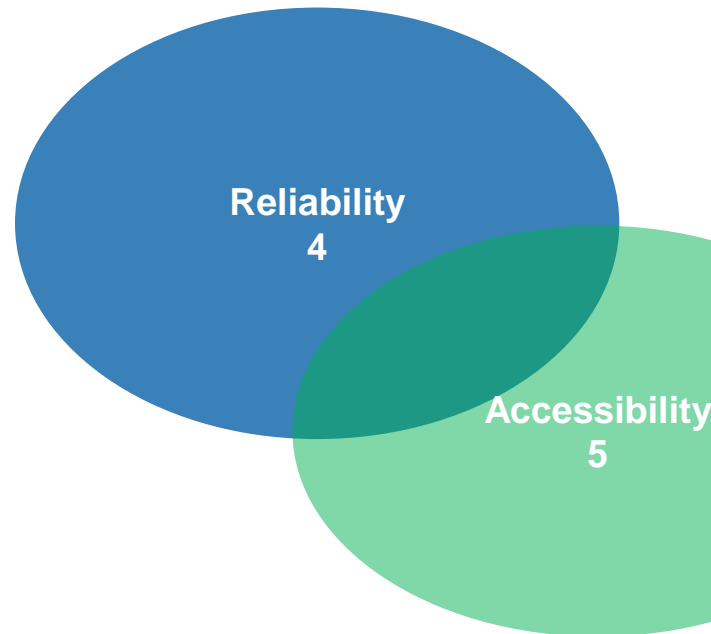
Need to take into account the interaction with the other people of the Social LMS

Expert in a Social LMS:



‘The fact of being active and collaborative in order to increase the quality and quantity of knowledge flow of the network’

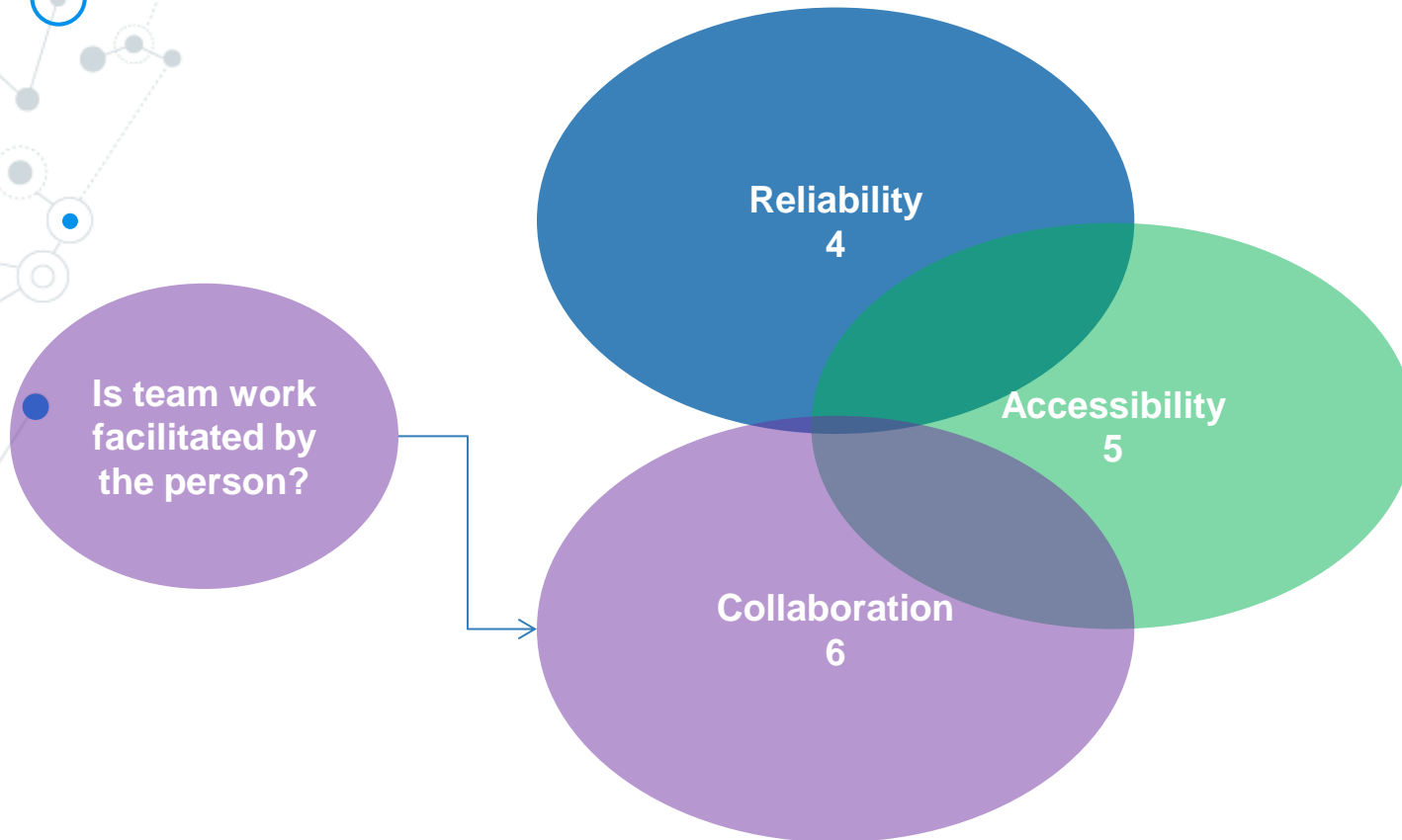
Expert in a Social LMS:



Is it easy to reach that person? Does he/she respond promptly when addressed?

‘The fact of being active and collaborative in order to increase the quality and quantity of knowledge flow of the network’

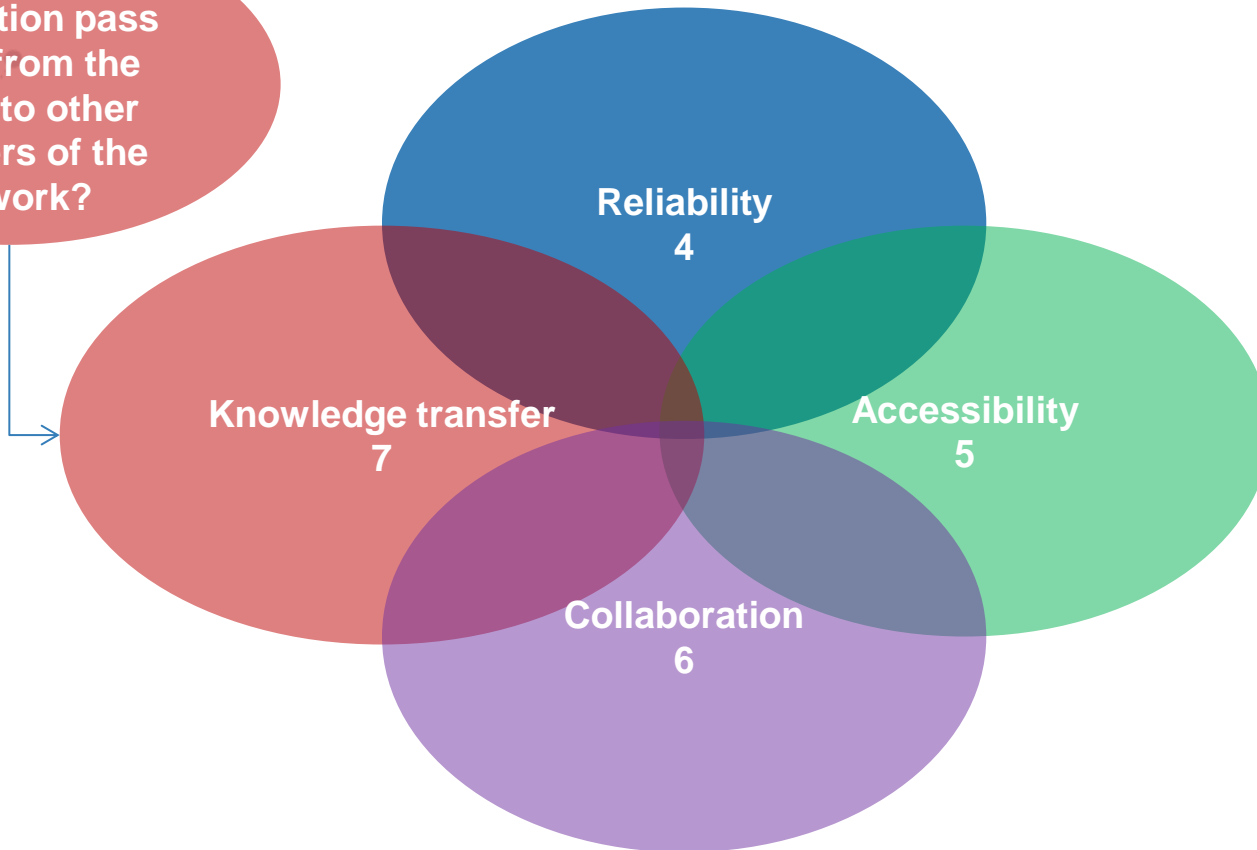
Expert in a Social LMS:



‘The fact of being active and collaborative in order to increase the quality and quantity of knowledge flow of the network’

Expert in a Social LMS:

Does the
information pass
easily from the
expert to other
members of the
network?



‘The fact of being active and collaborative in order to increase the quality and quantity of knowledge flow of the network’

the roles:

a way to structure the actions of the people of the network

Formal roles

Success of the student (grades)

Editorial Peer: create
new material

Editorial Roles

Editorial Leader:
supervise the creation of
the material

Social Contribution (quality,
quantity, appropriateness of the
contribution within the social
network)

Social Roles

Social Judgement: ability to guide
the other users on the contributions
available on the social network

the Formal Role:

This role describes the classical view of a student within a scholastic insitution

Grades

Did the student obtain a good
scholastic performance in a
particular subject?

KPI: average grade

$fg = [0, 1]$

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Different ranges of
values, but a re-
parametrization
where 0 is the
minimum and 1 is
the max is possible

The editorial Roles:

How peers interact within the publication workflow of informal academic material:

Editorial Peer

Collaborate with peers for the creation of new material

KPI: editorial production
(calculated according to the length of the path followed by the informal academic material before being published)

$$p = 1 / (1 + \mu_t t + \mu_l l + \mu_s s)$$

$ep = [0, 1]$

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$$ep=[0,1]$$

Editorial Leader

Lead a group of editors (peers) on the creation of material: suggest, correct and modify

KPI: editorial leadership
(correlation between leader and teacher ratings)

$$el=[-1,1]$$

The Social Roles:

The possible actions in an educational social network are related to the material produced and how this material is reviewed

Social contribution

Quality and Quantity of the material which is made available of the other peers within the social context

KPI: social contribution
(quality, quantity and appropriateness) of the published informal material

$$SC = [-1, 1]$$

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KPI: social contribution
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$$SC = [-1, 1]$$

Social Judgement

Nowadays an important feature in social networks is the possibility to evaluate the material

KPI: correlation between the quality of informal academic material and judgement expressed

$$SJ = [-1, 1]$$

an indicator for Expert in a Social LMS

$$Xp = \lambda_{fg} \cdot fg + \lambda_{sc} \cdot sc + \lambda_{sj} \cdot sj + \lambda_{ep} \cdot ep + \lambda_{el} \cdot el$$

Linear convex combination of the KPI
obtained with the different roles

$$(\lambda_{fg} + \lambda_{sc} + \lambda_{sj} + \lambda_{ep} + \lambda_{el} = 1)$$

Formal Role

Social Contribution

Social judgement

Editorial peer

Editorial leader

When considering a person within a network, **expertise** is no longer a singular property of the person, but it arises from the interaction with the rest of the network: it **becomes a global property**.

The natural range of many KPI describing expertise in a Social LMS spans **negative values**

Although one might consider that is a simple re-parametrization, in our opinion it reflects an important fact

The actions of some students can **DEGRADE** the knowledge flow of the EsuSN:

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The actions of some students can **DEGRADE** the knowledge flow of the EsuSN:

Anti-Expert

The range of values describing an expert in a Social LMS should be extended

beginner

expert



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The actions of some students can **DEGRADE** the knowledge flow of the EsuSN:

Anti-Expert

The range of values describing an expert in a Social LMS should be extended

anti-expert
(e.g. troll)

beginner

expert



Conclusions:

The large amount of data produced within a Social LMS calls for novel indicators for better managing the knowledge flow within the EduSN.

Roles have been defined to characterize the actions within the Social LMS

The roles help to accomplish goals and allow to monitor the activities

We defined a workflow for the creation of informal academic material in a Social LMS

Inclusion, ease, responsibility, high quality

A definition of “expertise within a social LMS context” is provided

Social interaction becomes a key feature to define expertise

Anti-Expert arises naturally from the KPI used to characterize expertise

No longer from novice to expert but a new scale:
Anti-expert -> novice -> expert

Future:

Characterization of the knowledge flows, using graph properties

Implementation