

Students Think more Critically on Internet than in Classrooms

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12 February 2007

Students' Internet Discussions?

- **How often do they think critically?**
- **How often do they create new ideas?**
- **How do disagreements and new ideas affect other students' responses?**

Internet Discussion Example

sci . math Search this group

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Description: Mathematical discussions and pursuits.

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Topic	Rating	Messages	Author	Date
Chem		2 new of 2	Mukhtar (1 author)	May 14
Roger Penrose's Weyl Curvature Entropy		1 new of 1	Jack Sarfaty (1 author)	May 14
Collaborate? Problem 11212/11220		9 new of 10	Alex. Lupas (8 authors)	May 14
Websites for White people. CAN YOU IDIOTS STOP THE CROSSPOSTING		15 new of 16	JTS Brown (13 authors)	May 14
harmonic functions		17 new of 18	Norm Dresner (7 authors)	May 14
analytical function+inequality		12 new of 13	eugene (3 authors)	May 14
I can't solve this problem		6 new of 6	john (5 authors)	May 14
complex integral question		2 new of 2	JEMebius (2 authors)	May 14
From space to space-time to energetic-space-time		39 new of 40	Golden Boar (15 authors)	May 14
differentiable structures		6 new of 6	Lee Rudolph (3 authors)	May 14
Notation of double integral, complex function		1 new of 1	James (1 author)	May 14
simple zeros of the entire function		9 new of 9	Oscar Lanzi III (6 authors)	May 14
Harmonic function on annulus question		3 new of 3	James (2 authors)	May 14
Fundamental solutions		1 new of 1	brtu...@gmail.com (1 author)	May 14
Finit State Automat		1 new of 1	Narek Saribekyan (1 author)	May 14
Hyper-sphere partitioning question		7 new of 7	Michael Orion (5 authors)	May 14

Internet Discussion Example

Google Groups ELITE

sci.math [No frame](#) | [Sort by date](#)

simple zeros of the entire function

- 1 [eugene](#) May 13
- 2 [Timothy Murphy](#) May 13
- 3 [Timothy Murphy](#) May 13
- 4 [Oscar Lanzi III](#) May 14
- 5 [mathman](#) May 13
- 6 [Phil Carmody](#) May 13
- 7 [quasi](#) May 13
- 8 [quasi](#) May 13
- 9 [Oscar Lanzi III](#) May 13

From: mathman - [view profile](#) Not yet rated
Date: Sun, May 14 2006 6:53 am [show options](#)

$(1 + 2^s + 3^s + 4^s)(s-1)s^s - 1$.

* $s-1$ zeroes are the fifth roots of unity, all different. To get the zeroes of your polynomial, discard $s=1$.

[Reply](#) Rate this post: ★★★★★

From: gaoweichen@gmail.com
To: Timothy Murphy <...@birdsnest.maths.tcd.ie>
[Add cc](#) | [Edit subject](#)

On May 14 2006, 6:16 am, Timothy Murphy <...@birdsnest.maths.tcd.ie> wrote:
 > eugene wrote:
 > > How can i prove the following:
 > > > All the zeroes of the entire function $1 + 2^s + 3^s + 4^s$ are simple.
 > > > What makes you think the function is entire?
 > > ...
 > Timothy Murohv

From: quasi - [view profile](#) Not yet rated
Date: Sun, May 14 2006 8:04 am [show options](#)

Learning Outside Classrooms

- **Course related Discussions**
 - Part course work online
 - Teacher moderation
- **Independent academic Discussions**
 - No course work
 - No teacher moderation
 - Free participation

Internet: More Accessible

- **Via a connected computer**
 - Individually
 - No need to gather a group of students
- **Join discussion at any time & any place**
 - Day, Night
 - School, Home, on Travel

Internet: More Critical Thinking

- **Adequate time for preparing & thinking**
 - Search for extra information
 - Refine personal ideas
- **Less concerns about self-image**
 - More willing to disagree others

Internet: Face-saving Concerns ↓

- **Not Face-to-face**
 - Less nonverbal cues (Face, Body, Voice)
- **Use Pseudonym- ID or Nickname**
 - Less real personal info
(No real name, gender, nor past grades)
 - Weaker social relationships
- **More Equality**
 - Less status effect

Data and Analysis

- **47 university students, 131 messages on 7 mathematics topics**
 - Free, un-moderated internet discussions
- **Dynamic Multilevel Analysis (DMA; Chiu & Khoo, 2005)**
- **Published in the best journal in the field: Computers & Education**

Results

<u>Message property</u>	<u>% of Messages</u>
Disagreements	40%
New ideas	51%
Engage others to respond	55%

Results

<u>Message property</u>	<u>Effect on next message</u>
Disagree	↑ Response by +22%
Disagree	↑ Disagree by +14%
New idea	↑ Disagree by +30%
High status person	No effect

Internet vs. Classroom Discussions

	<u>Internet</u>	<u>Classroom</u>
Critical Thinking	40%	Less than 10%
Disagree	More responses	End conversation
High status person	No effect, More equality	Defer to high status, Less equality

Implications for Parents and Teachers

- **Encourage children to join content-focused internet discussions**
- **Monitor children's internet use**
 - Reduce social conflicts on the internet
- **Use internet to discuss controversial topics**

Thank You!
