Age-related differences in ICT access and confidence among pre-service teachers

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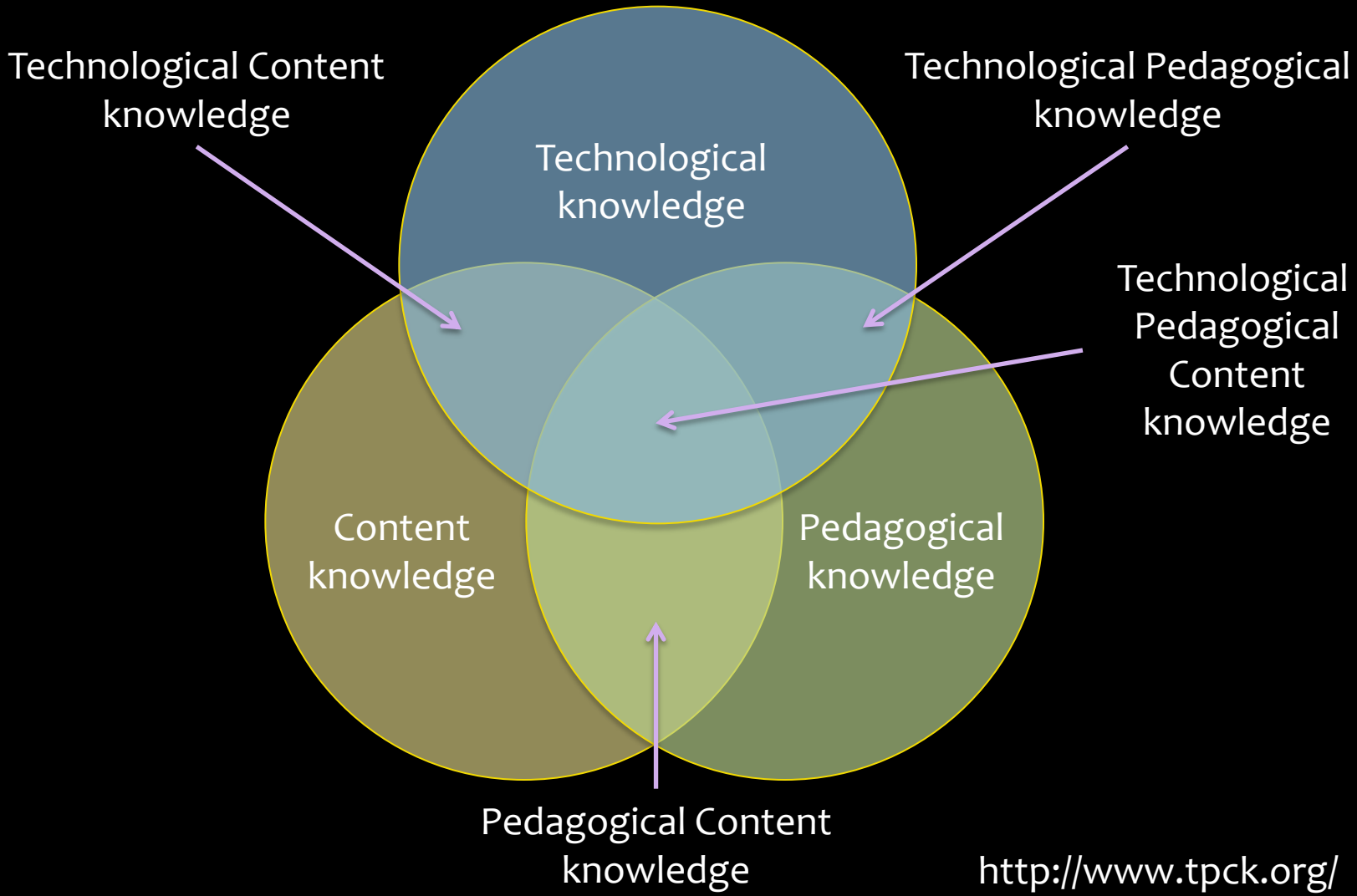
Digital Education Revolution

- Commitment to ICT in education
  - Knowledge & skills development
  - Improved learning
- Promised
  - 1:1 ratio for years 9 to 12
  - Improved broadband connectivity
- Recognised need for teacher development
  - ICT Innovation Fund

Teaching Teachers for the Future

- Successful bid for ICT Innovation Fund (pre-service)
  - ACDE, AITSL, ACCE, ALTC/ESA coalition + 38 HEIs
  - $7.8 million for 2011 & 2012
  - 3 components
    - Extend graduate standards to include ICT
      - AITSL & ACCE + partners
    - Develop resources with examples of ICT pedagogy
      - ESA + partners
    - Revitalise teacher education for ICT integration
      - $150000 per HEI for staffing to support change
  - Technological Pedagogical Content Knowledge
    - Adopted as conceptual framework for TTF

Technological Pedagogical Content Knowledge – TPACK



http://www.tpck.org/

Unpacking TPACK

- TPACK produces creative, flexible ICT use by teachers
- Intersections are problematic
  - Integrative or transformative
- Technology in TPACK
  - Original included all technologies – pencil & chalkboard
  - Others distinguish transparent & emerging technologies
- A new form of literacy for teachers?
- Complexity requires systems thinking
  - Elements are interdependent
- Requires changes in teacher preparation

Generational change & DER

- Myth of the digital native
  - Digital natives vs digital immigrants
  - Residents or visitors
- Suggested solution is to harness student ICT skill
  - Expect new teachers to be natives
- Age distribution of pre-service teachers (DEST, 2006)
  - 45% were 25 or older
  - 10% were 40 or older
- Generational change will not solve the problem

Preparing teachers for DER

- Success of DER depends upon prepared teachers
- Adoption of TPACK signals
  - Preparation needs more than ICT skill
  - Intersections (PCK, TCK, TPK, TPCK) are important
- Technology knowledge will require
  - Skills for fluent ICT use
  - Capability to learn new ICT
- Useful to understand pre-service teachers'
  - Access to ICT
  - Capabilities with ICT hardware and software

Research questions

1. What levels of access do teacher candidates have to ICT hardware and services?
2. What levels of confidence do teacher candidates report for use of a variety of ICT applications?
3. What, if any, differences are found for responses of teacher candidates from different age groups (generations) or other identifiable groups?

Method

- Two Queensland Faculties of Education
  - Metropolitan & regional
  - Reporting only regional data in this paper
- Online survey
  - LimeSurvey
  - Instruments reported previously
  - 2170 students with reminders
  - 450 responses (21%) with research consent

% respondents by gender & age (N = 450)

	< 20	20-29	30-39	40-49	>=50	Total
Female	7.3	29.3	28.9	16.7	4.0	86.2
Male	1.6	4.2	3.6	4.4	0.0	13.8
Total	8.9	33.6	32.4	21.1	4.0	100

- 86% female compares to 80% national data (DEST, 2006)
- 58% aged 30 years or older
  - NOT predominantly digital natives

Access to ICT

Differences by age - * p < .05, ** p < .01

Computer & Internet access

Computer access

- Almost universal
  - 1% limited or inconvenient access
  - 62% had access to both desktop and laptop

Internet access

- Almost universal
  - 1.8% no access at home
  - 95% had broadband
  - 46% reported speed and capacity as acceptable

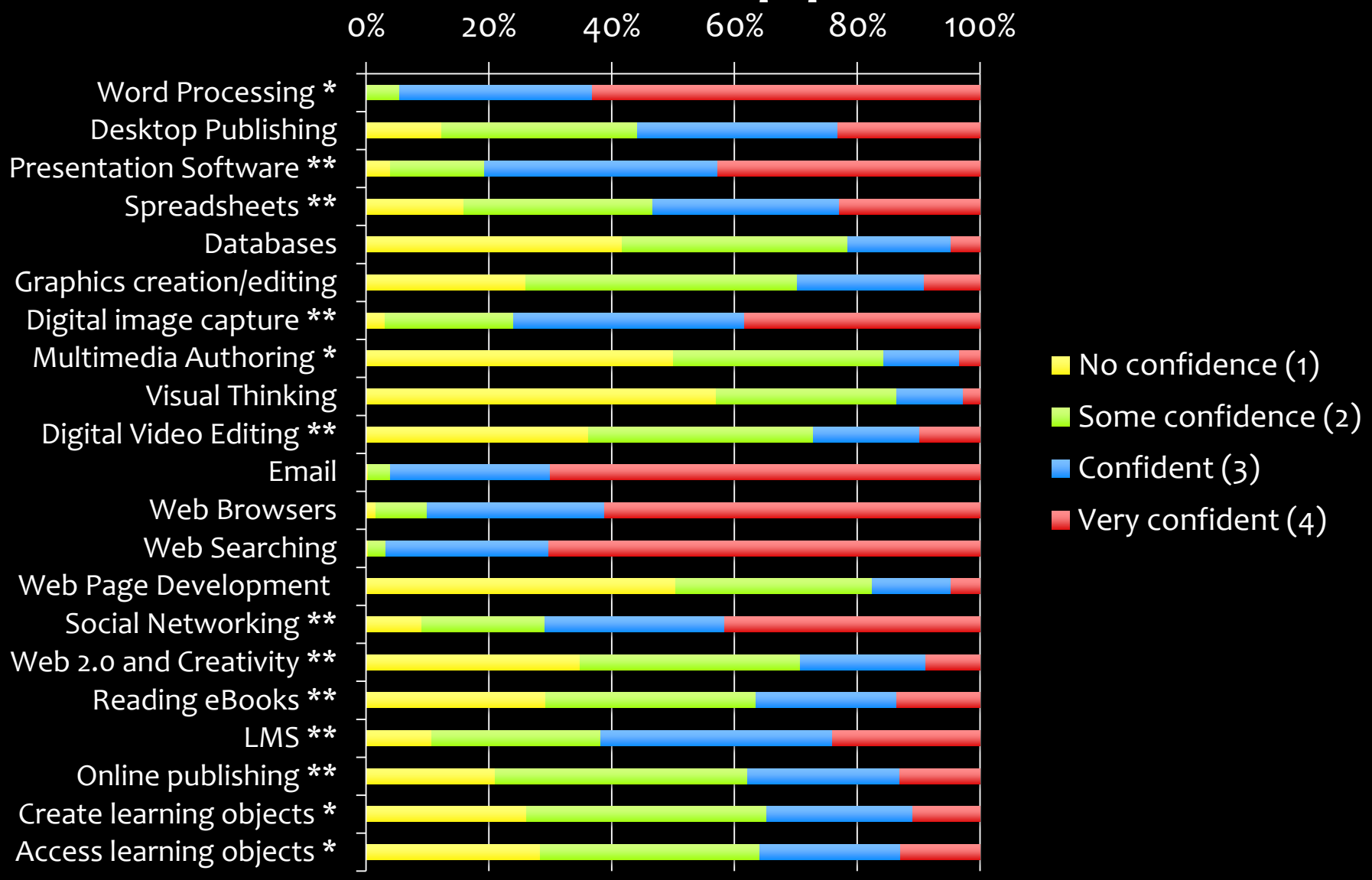
Access to newer ICT

- eBook reader
  - 86% no access
- Basic MP3 player
  - 28% no access
- MP3 player with video
  - 54% no access
- Most students not yet equipped for mobile study

Variations by age

- Significant differences ($p < .05$)
  - Portable computers, Internet access
  - MP3 players, game consoles, printers, digital cameras
- Effect sizes are small
- Higher access for younger users
  - MP3 players, game consoles, portable computers
- Other patterns unclear
- Limited evidence of generational gap
  - Except for MP3 player, game consoles & laptops

Confidence for ICT applications



Differences by age - * p < .05, ** p < .01

General confidence

- Confident with common applications
  - Word processor, email, web browser
- Not confident with less common applications
  - Spreadsheet, database, multimedia/web development
- Not confident with teaching & learning applications
  - Learning objects, online publishing, visual thinking

Variations by age

- Significant differences ($p < .05$)
  - 13 of 21 application categories
  - Older students (40-49 & 30-39) less confident
  - Small effect sizes
- Interpretation
  - Age-specific issues additional to general lack of confidence
- Effect of program progression
  - Some evidence of increased conference through years
    - Presentation, visual thinking, learning objects

Summary

- Most pre-service teachers
  - Have convenient access to ICT
  - Are confident with common applications
  - Have limited experience of emerging ICT
  - Limited confidence with uncommon or complex applications
- Some age related differences
  - Programs need to
    - Recognise existence of variation between & within age groups
    - Provide opportunities for all to extend experience

Implications

- ICT changes rapidly & societal uptake is strong
  - ICT skills for teachers are a moving target
  - Teacher preparation needs to develop
    - Skills with a wide range of ICT
    - Capability to continue learning ICT
- TTF seeks to develop TPACK
  - Requires an integrated approach
  - Not separated content, pedagogy & ICT

TTF ICT audits

- Project is auditing ICT integration in courses
- Identify & preserve what is useful
- Identify and respond to opportunities
- Understanding T in TPACK as emerging
  - Opportunities to work with new ICT
    - In content and pedagogy
  - Challenge to teacher education to adapt
- Data will be used to inform development

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