Do we know how to verify effects of e-learning in the lifelong learning?
Case study of the National Medical Library in Prague

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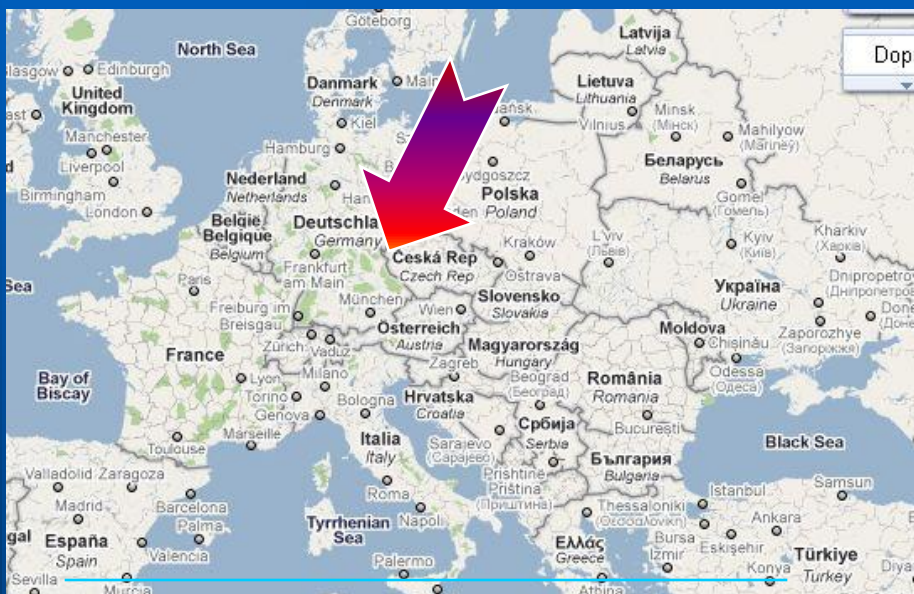
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Healthcare in the Czech Republic*

- Population

  10,5 Mio

- Density of population
  131 per /km^2
- Health establishments
  27 959
- Physicians and dentists
  42 509
- Pharmacists
  5 793
- Health service personnel
  105149

National Medical Library, Prague

- **Public specialized library (according to the Czech Library Act – No. 257/2001 Coll.) under Ministry of Healthcare**
- **Part of the Public Information Services in Healthcare - the net of medical libraries and information centers**
- **Collects print and electronic resources and provides information services in all areas of biomedicine and health care to both medical/health care professionals and public**
- **Main activities of the NML according to its statement**
  - **acquiring, organizing, and preserving the Czech medical literature**
  - **creating Czech national medical bibliography – Bibliografia Medica Czechoslovaca**
  - **translating MeSH into Czech**
  - **developing and providing integrated library system Medvik**
  - **collecting of specialized historical sources in the Healthcare Museum**
  - **providing library and information services based on the WHO information**
  - **providing support for medical libraries development and for training of biomedical librarians and other health information specialists**

Medical libraries in the Czech Republic

(as of 31th December 2010)

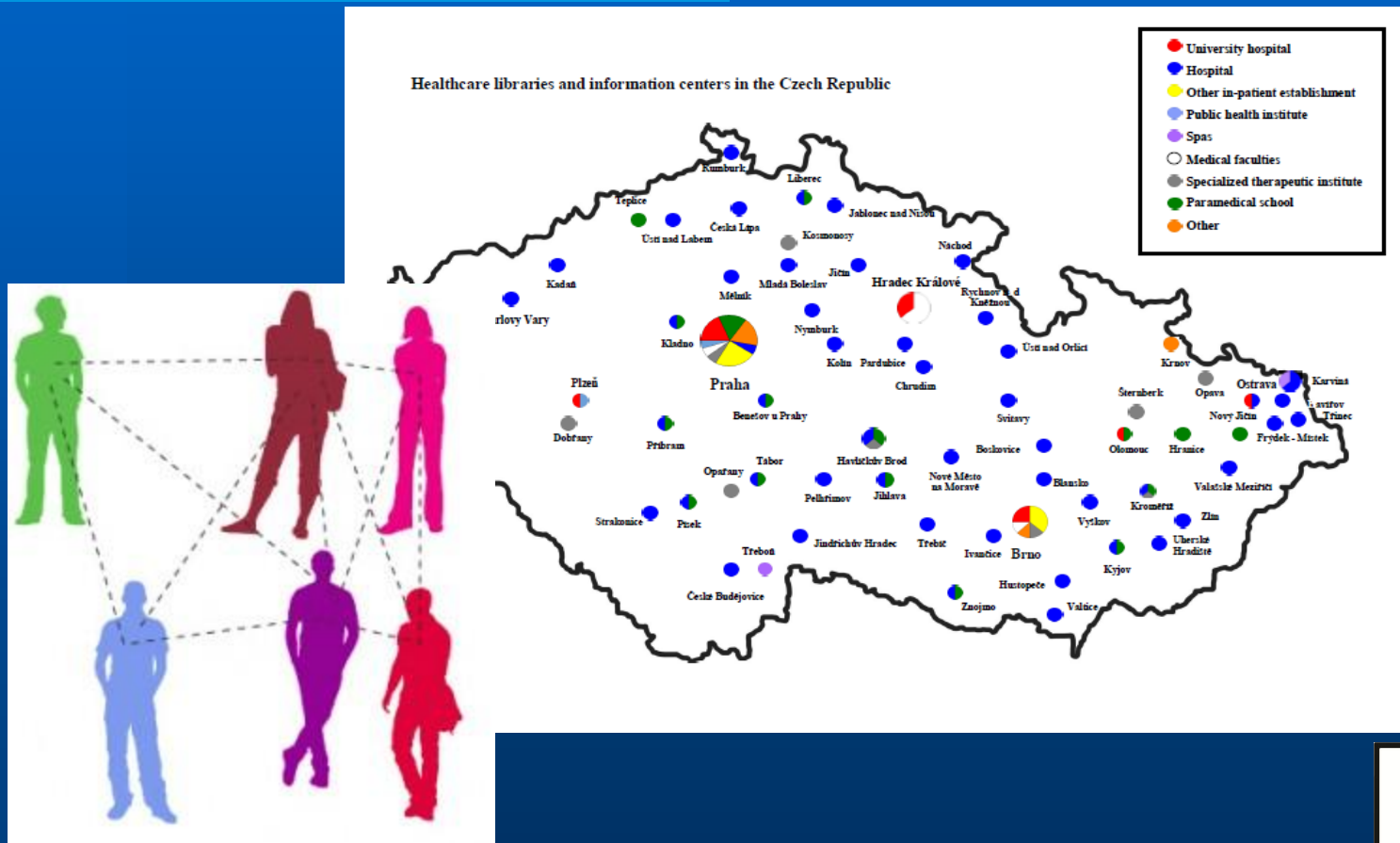| Total number of Czech public libraries	6430

Medical libraries		
Type of healthcare establishment	**Libraries**	**Librarians**
Hospitals	**50**	**52**
Other in-patient establishments	**7**	**20**
Specialized therapeutic institutes	**10**	**10**
Public health institutes	**3**	**14**
Paramedical schools	**17**	**11**
Medical, social health and pharmaceutical faculties	**5**	**34**
University hospitals	**4**	**19**
Integrated libraries (faculty/hospital)	**5**	**55**
Other	**4**	**71**
Total	**107**	**286**

Public Library and Information Services in Healthcare

Healthcare libraries and information centers in the Czech Republic

Legend:
- University hospital
- Hospital
- Other in-patient establishment
- Public health institute
- Spas
- Medical faculties
- Specialized therapeutic institute
- Paramedical school
- Other

Lifelong education of medical librarians in the Czech Republic

- Specialized education is not a condition to perform a job of a librarian

- Up to 30 % of medical librarians have no library education (data from 2009 survey)

- Tradition of lifelong education of medical librarians reaches back to the 1970s

- Courses and seminars for medical librarians are organized by NML – under supervision and/or financially supported by the Ministry of Culture (project from Library Public Information Services program, part 2: Lifelong Education of Librarians), Association of Library and Information Professionals of the Czech Republic(SKIP) and Ministry of Healthcare

E-course „Modern procedures in medical libraries"

- Target group - medical librarians in smaller hospitals and other types of healthcare institutions with absence of proper education or sufficient experience
- Goals
  - ❑ Facilitate access to lifelong learning for regional librarians
  - ❑ Offer a platform for updating of specific knowledge
  - ❑ Equalize library practices and current knowledge
- Content
  - ❑ Library system in the Czech Republic, legislation, medical libraries
  - ❑ Medical terminology, MeSH
  - ❑ Specialized medical information resources
- Duration – 6 weeks, approx. 24 learning hours
- Certificate
- LMS - Moodle hosted by the Charles University Computer Centre in Prague

Methods of course construction

- Principles of course construction – constructivism (Piaget, Vygotsky, Bruner)
  - Assimilation and accomodation - based on changes of students' behaviour patterns
  - Encouraging students to interaction, social communication, creation of own findings, knowledge structure and critical assessment of information

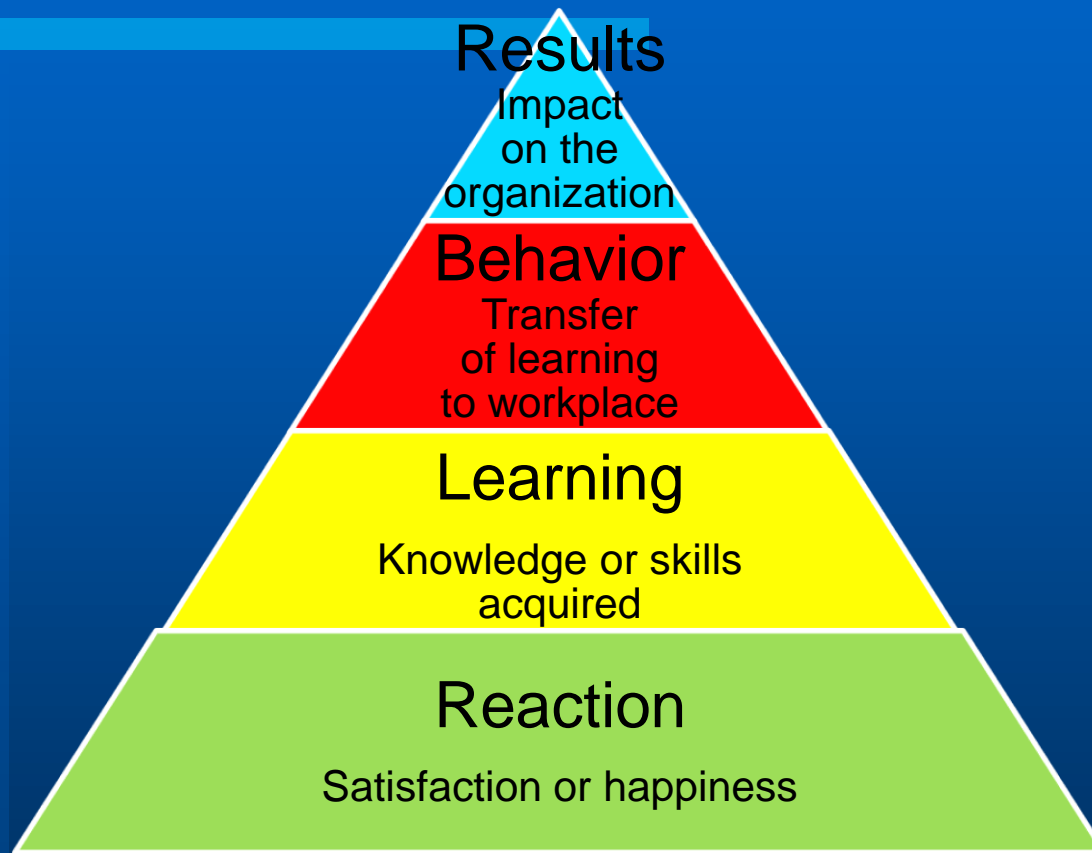Constructivism as a paradigm for teaching and learning [online]. Educational Broadcasting Corporation, 2004 [cited 2011 Jun 16]. Available from: http://www.thirteen.org/edonline/concept2class/constructivism/index.html

Christie, Alice A. Constructivism and its implications for educators [online]. Alice Christie, 2005 [cited 2011 Jun 16]. Available from: http://alicechristie.com/edtech/learning/constructivism/index.htm

Methods of course evaluation and assessment

Results
Impact on the organization

Behavior
Transfer of learning to workplace

Learning
Knowledge or skills acquired

Reaction
Satisfaction or happiness

Donald L. Kirkpatrick four-level evaluation model

Evaluation and assessment tools

- Level 1: Reaction
  - evaluation questionnaire at the end of the course – 10 questions
  - contributions to discussion forum
  - meetings with participants at the end of the course
- Level 2: Learning
  - preliminary and final test comparison (17 questions covering main course themes)
  - assessment of the course assignments
- Level 3: Behavior
  - questionnaire sent to students 3 months after the course completion, aimed at using the newly acquired knowledge in everyday work
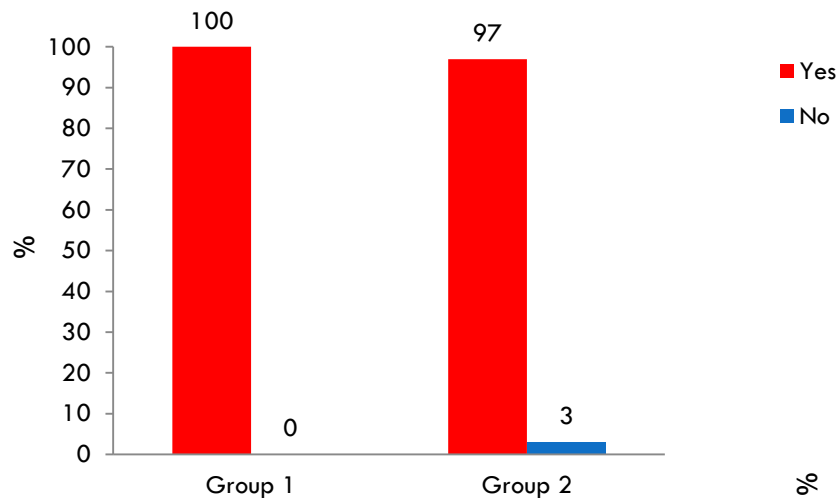- Level 4: Results
  - not measured

Study groups

- Group 1 – pilot – November - December 2010
  - 15 students selected from regional partner libraries, all finished

- Group 2 – March – April 2011
  - 39 students (all medical librarians were invited)
  - 36 finished

- Differences between the groups
  - greater percent of participants with library/information education in Group 1 – 73 % compared to 59 %
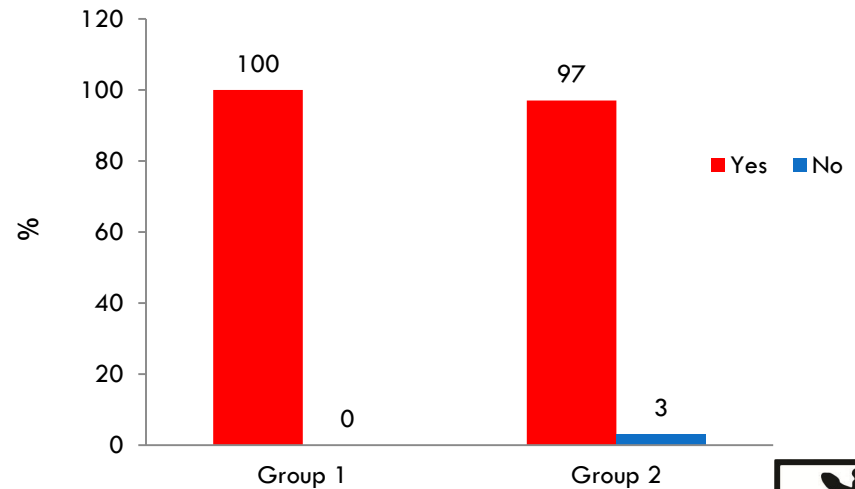 - longer average library experience in Group 1 - 25,5 years compared to 19,8 years

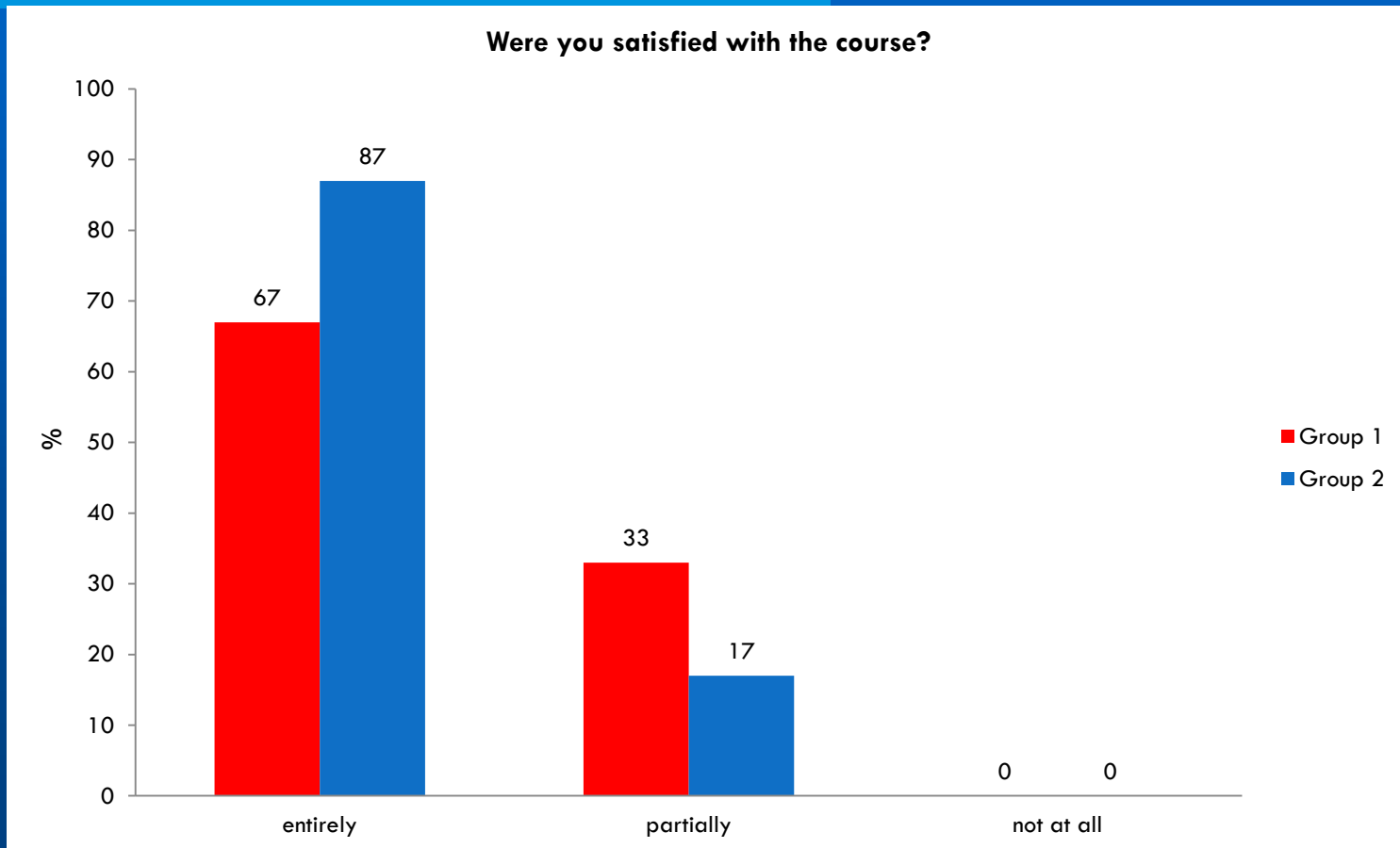# Results – Level 1 – satisfaction with e-learning

Is the e-learning a convenient form of a course for you?

Would you take part in any other e-learning course?

Results – Level 1 – satisfaction with the course


Were you satisfied with the course?

Results – Level 1 - summary

- E-learning form was accepted positively by most participants
- 78 % of participants were entirely satisfied with the course, 22 % partially
- Average ranking of each lesson varied from 1 to 1.5
- Acknowledged benefits of the course - using MeSH headings, overview of medical databases and searching via the new NML interface for catalogues
- Participants did not seek advantage from the discussion forums

Results – Level 2 - tests

Average results of pre and posttest
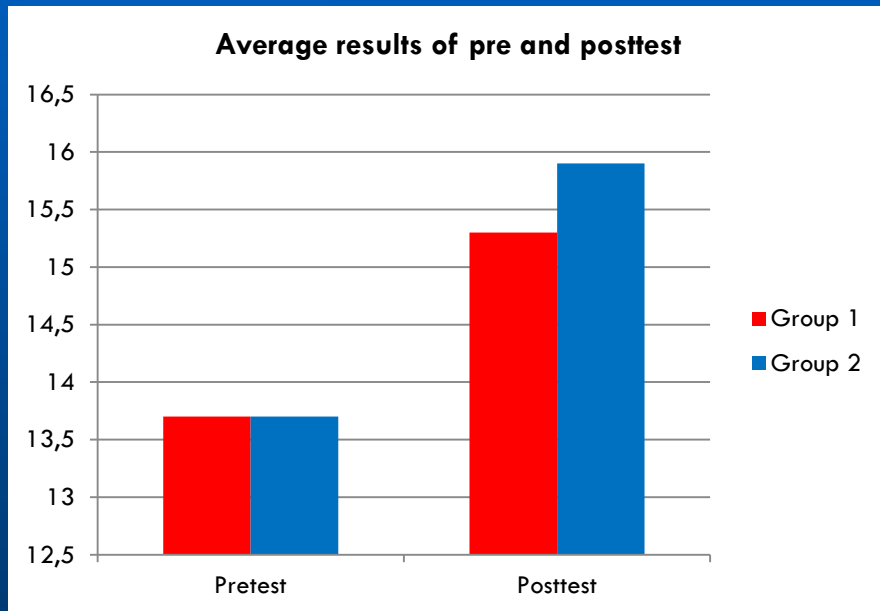
- The average results of the tests were improved in both groups
  - Group 1 – from 13.7 points (preliminary test) to 15.3 points (final test)
  - Group 2 - from 13.7 points to 15.9 points
  - 78 % of participants improved their test results
- Assignments - 98-99 points from 100 possible on the average, the lowest grade - 70 points
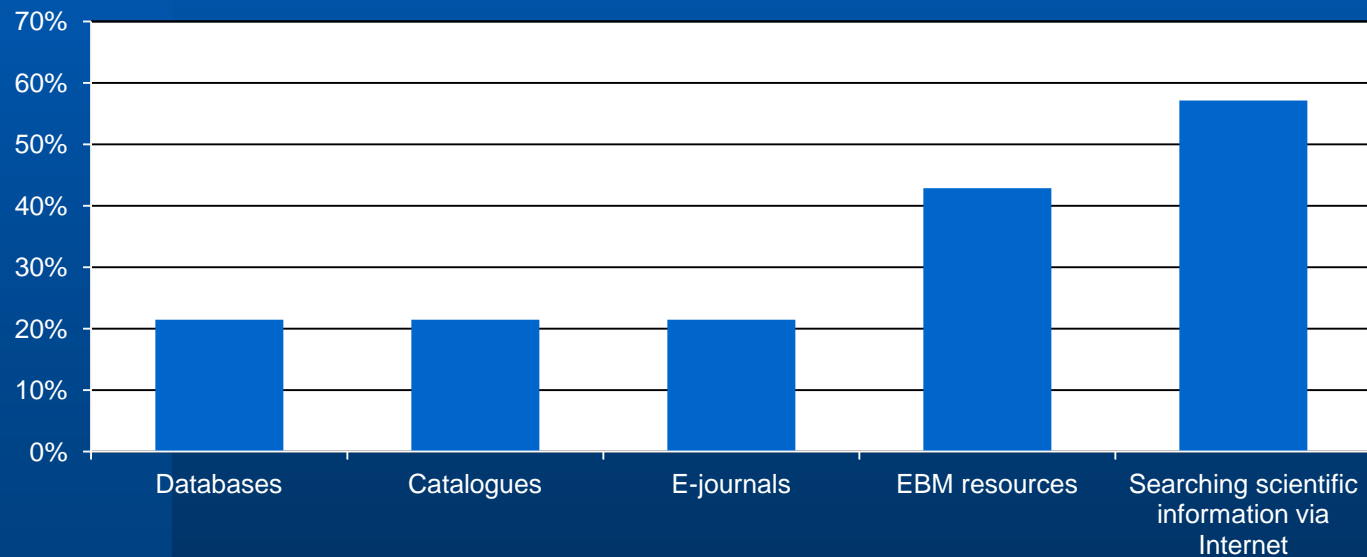
Results – Level 3 – transfer of learning

Have you made any changes in your library's services based on the knowledge acquired during the course?
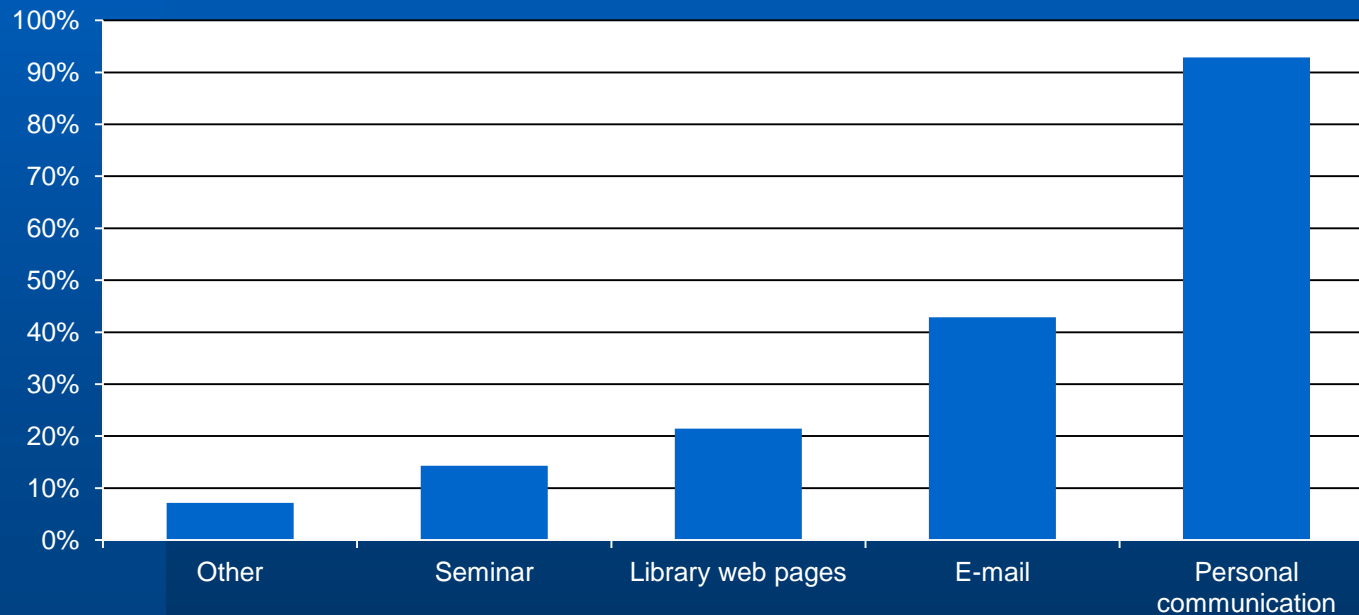
50%   50%

■ Yes ■ No
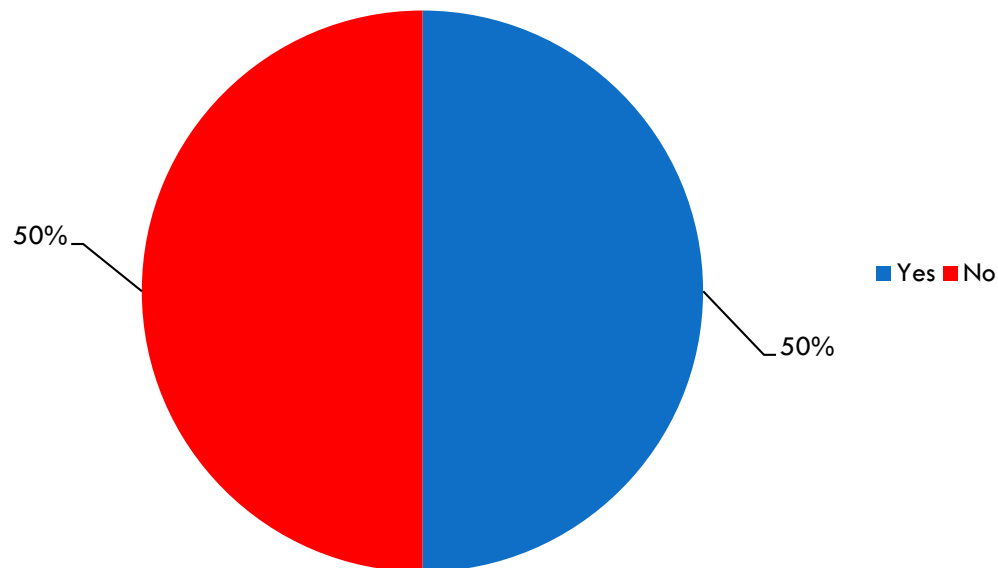
Results – Level 3

In which field have you broaden access to the information resources?

Results – Level 3

How do you advise your users abour resources you learned about during the course?

Results – Level 3 - summary

- 50 % participants from the first group reported changes in their practices, e.g.
  - ☐ 36 % newly began to use MeSH headings for searching
  - ☐ 57 % of participants began to advise their users of possibilities to search scientific information via the Internet, 25 % of EBM resources
  - ☐ All the participants inform their users to some degree of the new pieces of knowledge from the course, namely 93 % by personal communication, 43 % via e-mail, 21% via web pages and 14 % by organizing seminars

Discussion - Did we succeed in achieving the main objectives?

- We facilitated the access to lifelong learning for regional librarians – 23 students never participated in any NML courses before (nearly 10 % of all medical librarians)

- We assembled a unique collection of learning objects, that are otherwise not available

- We supplied basis for regenerating the profession

Discussion - What did we learn about e-learning?

- Advantages of e-learning
  - Development in usability, portability, expandability, cost-effectivity and accessibility of learning objects
  - Time and travel cost savings for participants
  - Number of students not limited due to the lack of computers and study places
  - A wide range of learning objects accessible from one point
  - Empowerment of professional fellowship

Discussion - What did we learn about e-learning?

- Drawbacks of e-learning
  - Students' feeling of isolation, lack of motivation due to the absence of personal communication with the tutor
  - Librarians in one-person library have problems to find time for uninterrupted study
  - Initial costs of e-course are higher than that of traditional course
  - Preparation of materials and tutoring are as time consuming as in case of traditional courses and seminars

Discussion - What did we learn about evaluation and assessment?

- Evaluation and assessment tools
  - Tests and assignments probably too easy
  - Problems with assessment scales
  - Feedback mostly positive but limited to compulsory questionnaire
  - Evaluation questionnaire too general, we need better insight into what aspects of e-learning are most/least appreciated

Conclusion

- E-learning is a suitable alternative form of continuing professional development
- Kirkpatrick's model has proved to be suitable for our purposes of evaluation and assessment
- Recommendations for further development
  - Course content, tutoring etc.
    - Developing knowledge of communication theory and of methods of question construction
    - Enhancing the content with more multimedia
  - Evaluation and assessment tools
    - More complex assignments and tests
    - More detailed evaluation questionnaire
  - Learning objects repository – part of oncoming NLM's project „Archiving and online access to fulltexts of scholarly publications to support the advancement of science and education of medical and other health professions"

Bearers of good news for the next e-learning students

Graduation of part of the first group

Thank you