

Innovation in Universal Design

“Universal integration of research, education, innovation and enterprise at DIT GrangeGorman”

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Three University Missions

- Research – Scholarly monasticism evolving into dynamic engagement
 - Broadstone “Science & Industry Centre”
- Education – Holistic view of student life and lifelong learning
 - “Two Hearts” Academic/Health & Social/Cultural
- Service – University as civic catalyst
 - “Connections” as “City Building

Successive Trends

- ***Convergence of Science & Technology***
 - Public funding for Basic Research generates a repository of conceptual knowledge;
 - Innovation expected via *Diffusion Model*.
- ***Convergence of Science, Technology & Society***
 - Public funding for Applied R&D generates a repository of prototype devices/services;
 - Innovation expected via *Linear Model*.
- ***Convergence of Government, Academia, Industry***
 - Integrate three sectors in Problem Solution.
 - “Open” innovation and evidence-based impacts.

Third Wave Convergence

- *Knowledge is embodied in three distinct states:* generated by Research, Development and Production methods respectively.
- *Industry is critical missing partner:* Government and academic projects intended to benefit society fail to cross market delivery gaps.
- *Evidence supports collaborative approach:* Links three methods, communicates knowledge in three states, and integrates key stakeholder.

1) Discovery State of Knowledge

- ✓ Research methods create new knowledge.
- ✓ Process – Empirical analysis reveals novel insights regarding key variables.
- ✓ Output – **Conceptual Discovery** expressed as manuscript or presentation - diffusion.
- ✓ Value – **Novelty** as first articulation of new concept as contributed to knowledge base.

2) Invention State of Knowledge

- ✓ Development methods apply knowledge.
- ✓ Process – Trial and error experimentation and testing demonstrates proof-of-concept.
- ✓ Output – **Tangible Invention** embodied as operational prototype - transfer
- ✓ Value – **Novelty** of conceptual discovery + **Feasibility** of tangible invention.

3) Innovation State of Knowledge

- ✓ Production methods codify knowledge.
- ✓ Process – Systematic specification of components and attributes yields final form.
- ✓ Output – **Market Innovation** embodied as viable device/service in defined context - commercialization.
- ✓ Value – **Novelty, Feasibility + Utility** as revenue to company, function to customers.

Delivering Solutions to Problems involves progress across three Knowledge States

Research → *Discovery* → Translation → Utilization ↓

Development → *Invention* → Transfer → Integration ↓

Production → *Innovation* → Release → Lifecycle ↓

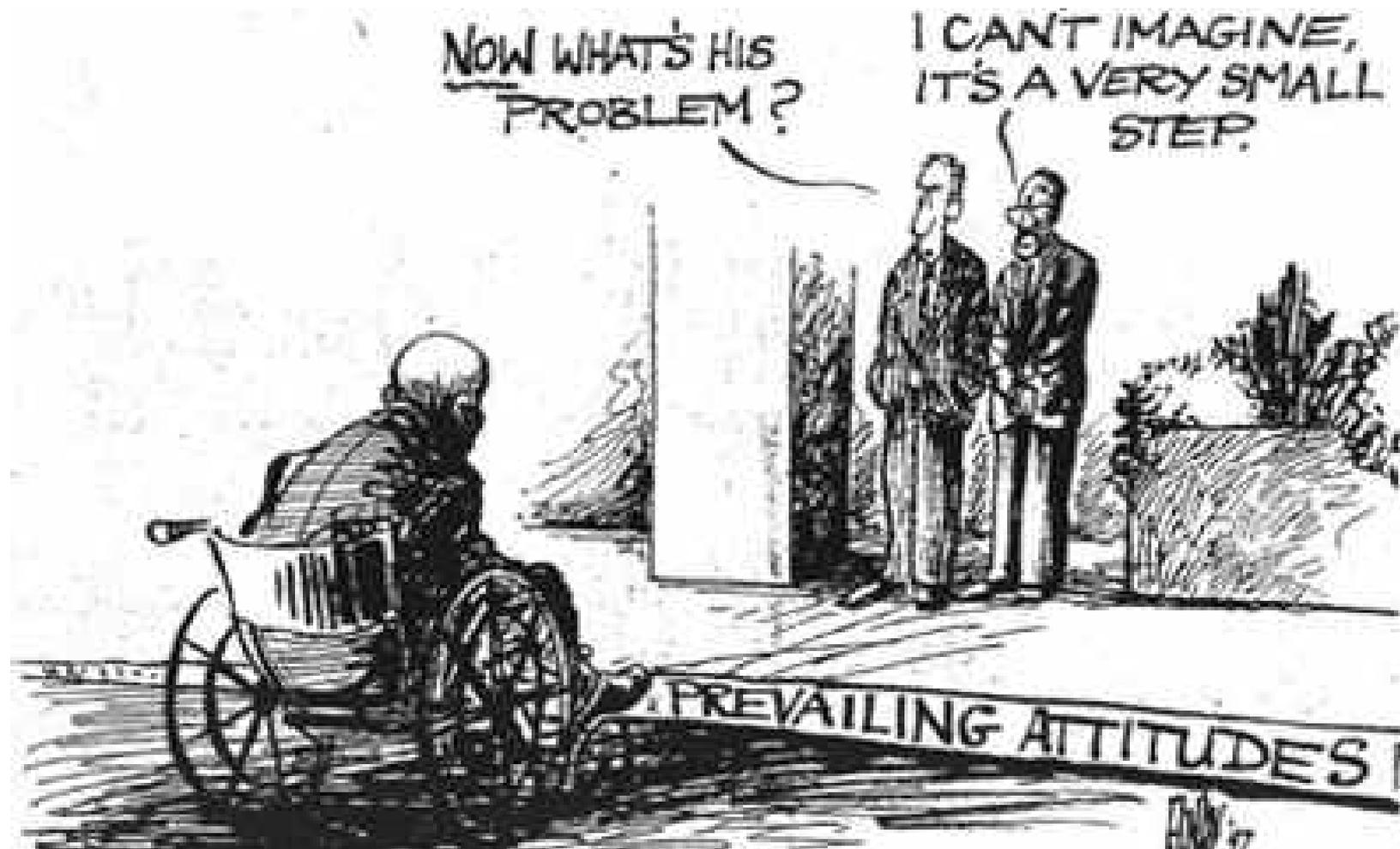
7 Principles of Universal Design share attributes of an Innovation

- **Novelty** in that a product, system or environment offer more features or adaptability than those that previously existed.
- **Feasibility** in that a product, system or environment operates as intended under the full range of conditions specified in the design.
- **Utility** in facilitating function despite the variations in the user's abilities or their approach taken to the task, while generating an appropriate return to the provider to sustain operation and support.

UD Principles abound in Journals

Quality Progress; IEEE Trans on Eng Mgt; Harvard Business Review; Quality Eng; European J. of OR; Trends in Food Sci & Tech; J. of Prod & Brand Mgt; J. of Prod Innov Mgt; Eng Mgt; J. of Eng Design; Int. J. of Prod Res; Behavioral Res in Acct; R&D Mgt; Int. J. of Prod Dev; Knowledge & Process Mgt; Medical Device Tech; Production Plan & Control; Strategic Direction; J. of Eng & Tech Mgt; Creativity & Innovation Mgt; J of Prod Dev; Industrial Mgt & Data Systems; Int. J. of Operations and Production Mgt; Res. Tech Mgt; Advances in Competitiveness Res; Int. J. of Medical Marketing; Computers in Industry; J. of Business Res; Int J of Production Economics.

What's left to do?



Lead the Change!

A new scientific truth does not triumph by convincing its opponents and making them see the light,

but rather because its opponents eventually die, and a new generation grows up that is familiar with it.

- Thomas Kuhn quoting Max Planck

DIT/CEUD: UD & Innovation

- The core principles and practices of Universal Design need to become fully integrated into theory and practice before their benefits to society are fully realized.
- Collaborative programs between government, academia and industry could address five key UD areas at DIT GrangeGorman, supported by the CEUD.

1) Clarify/Improve Definition & Principles

- **Definition** – Easy to comprehend, sound feasible and affordable, reflect social participation, and address the public's emotional responses to design.
- **Principles** – Substantiate with a set of goals that define what UD seeks to achieve in measurable terms.
- **Alignment** – Related UD to social justice, sustainability and public health.

2) Overcome Utopian Ideal

- UD viewed as unrealistic and unobtainable, particularly in industry.
- R. Mace: “to the greatest extent feasible”
- E. Steinfeld: “universal designing.”
- EU – “Design for All” → “Design for More”
- Market Broadening, Trans-Generational or Human Centered Design.

3) Increase Supply of UD

- Partner with designers, builders, developers and manufacturers, as well as the building regulatory community.
- Promote participation in voluntary standards and building codes.
- Education and train next generation of scholars and practitioners in paradigm.

4) Increase Demand for UD

- Educate the public, particularly segments who experience functional impairments.
- Educate policy makers about the need to design for changing demographics.
- Promote exemplars of UD in products, building and environments.
- Collaborate with manufacturers and buildings responding to market forces.

5) Promote Evidence-based Practice

- Pervasively integrate theory and practice in programs and environments.
- Collect and evaluate data on outcomes to evaluate effectiveness of UD interventions, assess the quality of services delivered, and relate programs to policies.
- Apply knowledge translation to gather and review UD findings, then communicate results to all stakeholder groups.

Universal integration of research, education, innovation and enterprise at DIT GrangeGorman? Yes!

- *Macro trends favor integration of knowledge in all states, and implementation for impact.*
- *Universal Design principles ready for refinement, expansion and demonstration.*
- *Government, academia and industry may achieve alignment at this time and in this place.*
- *Champions now need to influence planning, policy and practice.*

