

Summary Document—Scholarly/Creative Activity

Professor

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Introduction

Dr. Knudson's research focuses on the biomechanics of tennis and stretching, movement diagnosis, learning biomechanical concepts, and the influence of kinesiology scholarship. He is in his 9th year as a Texas State faculty member, however as past chair of the Department of HHP he was ineligible for Presidential Awards. Despite working at teaching institutions the first two decades of his career with a 4-4 teaching load, Dr. Knudson has established an outstanding record of scholarship that has only accelerated with his move to Texas State in the Fall of 2009. He has published four books, 17 chapters, 101 journal articles, 31 proceedings papers, and received numerous grants for his research. He has been elected a fellow of three scholarly societies and received state, regional, national, and international scholar awards. His refereed scholarship has been cited over 3440 times in *Google Scholar*, with a *h*-index of 29, individualized *h*-index of 21, and a *g*-index of 52. The summary below emphasizes his achievements since coming to Texas State, with particular attention to the last 5 years most relevant to the award criteria. Citation counts in this summary were updated January 17, 2018.

Sustained Commitment/Activity

Continuous peer-reviewed publications in respected biomechanics, kinesiology, engineering, and sports medicine journals since 1989. About 80% as first author peer-reviewed publications with an overall mean of 1.9 authors per publication.

- Last 8.5 years at Texas State with significant service responsibility as department chair
 - 39 journal articles
 - 12 proceedings papers
 - 12 chapters
 - 2 books
 - 12+14=26 presentations
- Last 5 years
 - 28 journal articles
 - 7 proceedings papers
 - 10 chapters
 - 2 books
 - 7+9=16 presentations

Internal/External Recognition

Research has resulted in state, regional, national, and international scholar awards, as well as numerous invited presentations (13 since 2009 and 8 since 2013). Dr. Knudson has previously been ineligible for internal awards at Texas State from serving as a department chair from 2009-2017.

- Six career awards for scholarship in the field since coming to Texas State
 - 2016 *Life Member Award*: International Society of Biomechanics in Sports
 - 2016 *Dudley Allen Sargent Award*: NAKHE
 - 2011 *Ruth B. Glassow Biomechanics Honor Award*: NASPE
 - 2010 *Southeast ACSM Scholar*: ACSM Southeast Chapter
 - 2017 *Scholar Award*: SHAPE America Southern District
 - 2016 *TAHPERD Scholar Award*: TAHPERD
- 2017 *Jerry R. Thomas Distinguished Leadership Award*: AKA
- In 2005 Dr. Knudson received the university wide *Professional Achievement Honor Award* from California State University-Chico for the impact of his research agenda

Impact or Significance of Endeavors

Dr. Knudson's research has been influential in advancing biomechanics research techniques, the theory of qualitative diagnosis of human movement, teaching and learning biomechanical concepts, and advanced professional practice in kinesiology/exercise science and tennis.

- Pioneered technical advances in conductive elastomer hand force measurement (Knudson & White, 1989) that has since expanded to other sports and areas of the body data ($c=47$)
- Pioneered smoothing and kinematic calculation techniques near impacts in sport (Knudson & Bahamonde, 2001) that has been used extensively in the field and highly cited ($c=79$)
- Authored the first book on the professional skill of *Qualitative Diagnosis of Human Movement* which is in its 3rd edition (Knudson, 2013). The book has been translated into 7 languages and is highly (415) cited. His *Fundamentals of Biomechanics* book is also highly (319) cited.
- Invited to write biomechanics chapter for *ACSM's Resource Manual for Guidelines for Exercise Testing and Prescription* (Knudson, 2010, 2014)
- Lead the development of a nationally-normed concept inventory (Knudson et al. 2003) for the introductory biomechanics class ($c = 23$) that has been used extensively in Scholarship of Teaching and Learning research in the field
- Published numerous studies ($n=22$) on learning biomechanical concepts at the undergraduate and graduate level. Have been recognized nationally and internationally for this research (three invited lectures on his research on learning biomechanical concepts since 2009)
- Eight journal articles published with master's or doctoral students as coauthors
- Research on stretching (e.g., Knudson, 1998, 1999; Knudson et al. 2001) initiated an explosion of research on pre-activity stretching and resulted in the transformation of warm-up protocols all over the world
 - Stretching research has been cited over 570 times since 1998
 - Published first dose-response study of stretch-induced strength deficits (Knudson & Noffal, 2005) and has been highly ($c=88$) cited and confirmed
 - Research used by the USTA to revise warm-up protocols for US player development, instructional/coach education articles, and *Dynamic Tennis Warm-up DVD*
 - Stretching research featured twice in the *New York Times* and in several other popular press publications
- Authored (Knudson, 2009) the 9th most cited ($c= 86$) paper in the journal *Sports Biomechanics* on statistical and practical significance of research in the field
- Coauthored the most read article (Chow & Knudson, 2011: over 7,000 reads) in journal *Sports Biomechanics* ($IF_5= 1.4$). Based on *Research Gate*, *Scopus*, and *Web of Science* it can be conservatively estimated that Dr. Knudson's research has been downloaded/read over 100,000 times in the last 9 years
- Scholarship has been highly cited by peers
 - Over 3440 citations in *Google Scholar*, 787 in *Scopus*, and 778 in *Web of Science*
 - Four citation classics ($c > 100$) in *Google Scholar*
 - h -index of 29 in *Google Scholar*
 - g -index of 21 in *Google Scholar*
 - $i10$ -index of 69 in *Google Scholar*
 - Several papers with high (1.8 - 3.0) Field-Weighted Citation Impact in *Scopus*
- Over 2,372 citations indexed in *Google Scholar* over the last 9 years
- Over 1,542 citations indexed in *Google Scholar* over the last 5 years
- Research published in the most prestigious journals in biomechanics and kinesiology (*Journal of Applied Biomechanics*, *Sports Biomechanics*, *Gait & Posture*, *Research Quarterly for Exercise and Sport*, *Journal of Sports Sciences*, *Sports Engineering*, *International Journal of Sports Medicine*, *Journal of Science and Medicine in Sport*, *European Journal of Applied Physiology*, *Journal of Strength and Conditioning Research*, *Sports Medicine*, *Quest*, *Kinesiology Review*)